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Chemicals and Allied Products

Drugs and Pharmaceuticals

EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. VII: EVALUATION OF PHENERGAN AND TRIMETON, by Herman L. Chinn, and Lawrence J. Milch. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 6p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107349

The following preparations were tested during simulated aircraft turbulence: (a) placebo; (b) Lergigan, 25 mg.; (c) Phenergan, 25 mg.; and (d) Trimeton , 25 mg. All three drugs reduced significantly the incidence of vomiting below that in the placebo group. Phenergan exhibited the greatest protection. Side effects with each drug were slight, an increase in drowsiness being the most apparent effect. The possibility that the effectiveness of Lergigan is due to an admixture with Phenergan is discussed. AAF SAM Proj. 21-32-014, Report no. 7.

Dyes

DROP SIZE DETERMINATION FOR CALIBRATION PURPOSES, by Abraham Koblin. U. S. Chemical Corps. Chemical and Radiological Laboratories. Test Division, Army Chemical Center, Md. Interim report. Jun 1952. 24p photos, tables Available from the Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107320

1. Drops - Measurement 2. CC CRL IR 155. Projects 4-04-15-021 and 4-80-04-005.

Plastics and Plasticizers

DIELECTRIC FILMS, HIGH TEMPERATURE. QUARTERLY REPORT NO. 2, 21 SEP 1948 TO 21 DEC 1948, UNDER CONTRACT NO. W-36-039-SC-38110. Sprague Electric Co., North Adams, Mass. Dec 1948. 31p tables Available from the Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107284

The initial phases of the dielectric research program were concerned with preliminary studies of various types of pentachlorostyrene copolymers. Processes for the preparation of pentachlorostyrene and divinyltetrachlorobenzene are given. A structural study of the intermediate used in the synthesis of divinyltetrachlorobenzene is presented and supplemented with experimental work. It is considered that the first phase of the film development may be best attacked by the preparation of flexible, coated foils. These foils may be readily tested for dielectric strength, temperature stability etc. As a second phase of the development, stripping techniques will be worked out for the most promising dielectric coatings. A series of CEROC-TEFLON type B coated copper foils were produced on the machine adopted thereto. Satisfactory processes were worked out for the production of this type of film as an adherent coating on copper. Flexibility, toughness and dielectric strength were noted for these films. A program covering the work planned for the next quarter is presented in some detail.

STRESS AND STRAIN AT ONSET OF CRAZING OF POLYMETHYL METHACRYLATE AT VARIOUS TEMPERATURES, by M. A. Sherman and B. M. Axilrod. U. S. National Advisory Committee for Aeronautics. Sep 1952. 21p photos, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107436

Stress and strain at the onset of crazing were determined for both general-purpose and heat-resistant grades of commercial cast polymethyl methacrylate. Tests were made at 23°, 50°, and 70° C on samples 0.15 inch thick. Other properties measured were tensile strength, total elongation, and modulus of elasticity. Results obtained indicate that a "critical-strain theory" for the threshold of crazing is not applicable to polymethyl methacrylate. Strain at the onset of crazing decreased with increase in temperature from 23° to 50° C whereas there was no consistent trend from 50° to 70° C. Stress at the onset of crazing was about 80 to 95 percent of the tensile strength at all three temperatures. NACA TN 2778.

Ordnance Chemicals

INVESTIGATION OF THE REACTION 2 $CACO_3$ + SIO_2 AT HIGH TEMPERATURES, by J. A. Hedvall and B. Liljegren. Chalmers University of Technology Gothenburg, Sweden. Institute for Silica Chemistry Research. 1952. 15p drawing, graph, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107366

The present investigation aims at investigating the importance of the grain size for the production of a pure calcium-orthosilicate, suitable as basis of further investigations. Chalmers University of Technology, Gothenburg, Sweden. Transactions no. 126.

Chemical Engineering and Equipment

DETERMINATION OF ALKOXYL GROUPS. I: DESCRIPTION OF A MODIFIED APPARATUS II: DETERMINATION OF ALKOXYL GROUPS IN THE PRESENCE OF SULFUR-CONTAINING SUBSTANCES, by Gunnar Gran. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1952. 7p photo, drawings, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107370

1. Benzoic acid, p-Hydroxy - Analysis - Sweden 2. Chemical apparatus - Drawings - Sweden 3. Alkoxyl groups - Determination - Sweden 4. Chemical analysis - Methods - Sweden 5. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 101. Summaries in German and Swedish.

Reprinted from Svensk papperstidning 55(1952) p. 255-257, 287-290.

Miscellaneous Chemicals

ABSTRACT BIBLIOGRAPHY OF THE CHEMISTRY AND TECHNOLOGY OF TUNG PRODUCTS, 1875-1950, COMPILED BY RALPH W. PLANCK AND FRANK C. PACK, SOUTHERN REGIONAL RESEARCH LABORATORY, AND DOROTHY B. SKAU, NEW ORLEANS BRANCH, U. S. DEPT. OF AGRICULTURE LIBRARY. VOL. I. U. S. Bureau of Agricultural and Industrial Chemistry. 1952. 243p Available from Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans 19, La. PB 107321

This compilation of more than 2800 references and abstracts of articles and patents relating to the culture of the tung tree, Aleurites fordii, and to the chemistry and technology of the tung fruit and of the oil and meal derived from the fruit covers the period 1875 to 1951. The references are arranged alphabetically by author under each subject division listed in the table of contents. Subject, author, and numerical patent indexes are provided. For vol. II see PB 107322. AIC 317, vol. 1.

ABSTRACT BIBLIOGRAPHY OF THE CHEMISTRY AND TECHNOLOGY OF TUNG PRODUCTS, 1875-1950, COMPILED BY RALPH W. PLANCK AND FRANK C. PACK, SOUTHERN REGIONAL RESEARCH LABORATORY, AND DOROTHY B. SKAU, NEW ORLEANS BRANCH, U. S. DEPT. OF AGRICULTURE LIBRARY. VOL. II. U. S. Bureau of Agricultural and Industrial Chemistry. 1952. 232p Available from Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans 19, La. PB 107322

1. AIC 317 vol. II.

For vol. I see PB 107321.

MIGRATION APTITUDES AS A CRITERION OF IONIC MECHANISM IN THE REARRANGEMENT OF MONO-P-NITROTRIPHENYLMETHYL HYDROPEROXIDE, by Paul D. Bartlett and John D. Cotman, Jr. Harvard University. Cruft Laboratory. Sep 1949. 23p table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107268

1. Hydroperoxide, (p-nitrophenyl) Triphenylmethyl 2. HU CL TR2.

Technical report no. 2 under Project no. NR-056-095, Contract N5ori-76, Task XX, period Oct 1, 1948-Aug 31, 1949.

OUT-OF-STATE PURCHASES OF CHEMICALS AND ALLIED PRODUCTS BY TEXAS ORGANIZATIONS, 1951, by James R. Bradley, W. B. Langford and L. S. Paine. Texas. Engineering Experiment Station, College Station, Texas. Jul 1952. 12p diagrs, map, table Available from Texas Engineering Experiment Station. The Texas Agricultural and Mechanical College System, College Station, Texas. PB 107287

1. Chemical industries - Statistics 2. Chemicals - Purchases - Statistics 3. Texas. Agricultural and Mechanical College, College Station, Texas 4. TU EES RR 37.

PROPERTIES AND PHYSICAL CONSTANTS DATA OF HIGH REFRACTORY MATERIALS, by Eugene Ryschkewitsch. U. S. Air Materiel Command. Office of Air Research, Wright-Patterson Air Force Base, Dayton, Ohio. Aug 1950. 32p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107256

Data on the properties and physical constants of high refractory elements, oxides, carbides, nitrides, and combinations are presented. AAF TR 6330.

Electrical Machinery

Communication Equipment

ANTIFRICTION BEARINGS AS A RADIO NOISE SOURCE, by H. E. Dinger and J. E. Raudenbush. U. S. Naval Research Laboratory. Jul 1952. 12p photos, diagrs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111034

During World War II, it had been noticed that under certain conditions machines employing antifriction bearings could be a troublesome source of radio noise interference. In order to study this phenomenon under the most favorable conditions, a special test assembly was built in which various bearings could be mounted and their noise characteristics examined. It was found that the noise generation was the result of erratic pulses of current flowing between the races of the bearing as a result of dielectric breakdown of the lubricant film and/or momentary metal-to-metal contacts between the balls and races. The potential causing this current flow in actual machines would exist between the shaft and the frame by electric induction as a result of the stray electric fields normally present. Any leakage currents tending to flow across the bearing as a consequence of inefficient insulation of the windings would also be a possible cause of radio noise. Antifriction bearings lubricated with low-viscosity lubricants, because of their much lower shaft-to-frame resistance characteristics, were found to generate somewhat less radio noise than when lubricated with high-viscosity lubricants. Insulating sleeves or other arrangements to prevent the flow of current through bearings should be considered whenever it is essential that a machine be free of any possibility of radio noise generation. NRL R 4023.

ELECTROMAGNETIC SCATTERING FROM WEDGES AND CONES, by Carlyle J. Sletten. U. S. Air Force. Electronics Research Division. Antenna Laboratory, Cambridge Research Center, Cambridge, Mass. Jul 1952. 30p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107439

An experimental study of microwave scattering from metal wedges and cones is presented. Plane wave illumination is used with scattering cross sections computed from standing waves on an image plane or in parallel plates. Results are compared with electromagnetic boundary value solutions and physical optics theory. AAF CRL E 5090.

EXPERIMENTAL INVESTIGATION OF MICROWAVE DIFFRACTION, by Ralph D. Kodis. Harvard University. Cruft Laboratory. Jun 1950. 102p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $4.50, Photostat $13.75.
PB 107273

An experimental setup for studying electromagnetic diffraction of microwaves by obstacles and apertures whose characteristic dimension is comparable to a wave length ( ) approached closely the idealized conditions for the corresponding theoretical problem and permitted measurements in the diffracted field with negligible disturbance of the original configuration. Undesirable electromagnetic interactions with the observer and the monitoring equipment were prevented by placing the components of the diffraction problem on the other side of the image plane, a conducting sheet oriented so that the most intense beams of radiation were directed into free space. The diffracted field was explored with an electric probe projecting through a small hole in the image plane. Diffraction measurements were made with obstacles illuminated by radiation from an electromagnetic horn driven by a reflex klystron oscillating at about 24,000 mc. Appropriate controls, microwave circuits, and metering equipment underneath the plane furnished means for determining accurately the amplitude and phase distributions in the diffracted field over a range of 40 db. To assess the reliability of the apparatus, measurements of diffraction by long conducting cylinders are compared directly with theoretical distributions calculated from a series for the scattered field derived by evaluating the appropriate Green's function and applying electromagnetic boundary conditions at the cylindrical surface. Distribution curves are also presented for a group of dielectric cylinders for which it would be much more difficult to compute theoretical curves. Contract N5 ori-76, Task order no. I, NR-078-011. HU CL TR 105.

FINAL ENGINEERING REPORT, CONTRACT NO. Y-18640, CONSULTING ELECTRONIC ENGINEERING SERVICES ON AVIATION MEDICAL ACCELERATION LABORATORY, NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PENNSYLVANIA, AND ELECTRONICS STANDARDS LABORATORY, NAVAL AIR STATION, NORFOLK, VIRGINIA. Electro-Search, Philadelphia, Pa. May 1952. 193p photos, drawings, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $7.00, Photostat $25.00. PB 107383

The work consisted broadly of designing radio interference suppression techniques into the constructional designs of the two laboratories, then following the initial design work with constructional techniques and inspection during the construction to insure compliance with good shielding practice, measurements of radio interference, and finally measurements of the effectiveness of the shielding after construction work had been completed. Unique shielding features are detailed. The extensive program of obtaining suitable low-noise slip rings for transferral of physiological signals from the rotating centrifuge arm to stationary apparatus is given in detail. Some theoretical considerations of radio interference, sliding-contact noise, and shielding effectiveness are presented. Pt. I written by Albert R. Kall, pt. II by Irving Zipper.

PRINCIPES ESSENTIELS DE PROTECTION DE LA RECEPTION RADIO CONTRE LES INTERFERENCES ENGENDREES PAR LES GENERATEURS A TUBES H. F. DE CHAUFFAGE PAR INDUCTION (ESSENTIAL PRINCIPLES FOR THE PROTECTION OF RADIO RECEPTION AGAINST INTERFERENCE PRODUCED BY HIGH FREQUENCY INDUCTION HEATED TUBE GENERATORS), by F. E. Ilgekit and K. W. Bajenow. Translated by L. C. Stevens. Jun 1952. 12p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107394

1. Radio interference - Elimination - Russia 2. Interference, Electrical - Elimination - Russia 3. NAVSHIPS T485 4. STS 145.

Translated from Radiotechnique vol. 4, no. 6, 1949, p. 14-23. This article was translated into French from the original Russian.

RADIO AND PUBLIC ADDRESS SYSTEMS. ADINTERIM GUIDE SPECIFICATION FOR WAR DEPARTMENT CONSTRUCTION. U. S. Army. Corps of Engineers. Jan 1947. 28p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75.
PB 107410

1. Public address systems 2. Radio - Installation 3. Radio receivers - Installation.
CE 303.13 (INT).

TRAVELING-WAVE TUBE AS A PHASE-SHIFTER, by I. D. Olin. U. S. Naval Research Laboratory. Jul 1952. 10p tables, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.25.
PB 111036

The advent of the traveling-wave tube fulfills the need for wideband amplification at microwave frequencies. Of further significance is the possibility of using the tube to produce an electronically controlled phase-shift over wide bands. Beginning with the results of Pierce, a simplified theory utilizing the method of least squares is presented for the operation of the tube as a phase-shifter. This method leads to a solution correlating phase-shift with changing beam voltage. The tube, within operating limits, may be considered as essentially comprising an amplifier cascaded by a transmission line whose physical length is adjusted electronically. The traveling-wave tube is believed superior to the klystron where approximately one cycle of electronically controlled phase-shift is desirable. NRL R 4026.

ULTRA HIGH SPEED FACSIMILE SYSTEMS, by John A. Erhart. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. May 1951. 19p fold table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107311

1. Facsimile equipment, Ultra high speed 2. Transmitters, Photographic 3. Photography, High speed - Remote transmission 4. Scanning systems 5. Radio transmission, Wide band 6. Ultrafax (Trade name) 7. Radio Corporation of America. R.C.A. Laboratories, Princeton, N. J. 8. SIG Contract W-36-039-

sc-32381. 9. SCEL TM M-1374.
Specification SCL-1083. Contract no. W-36-039-sc-32381.

Electronics

ELECTRON TUBE RESEARCH AND DEVELOPMENT: SUBMINIATURE VERSIONS OF RMA TYPES 6L6, 6AG7, AND ONE-HALF OF 6AS7G AND SUBMINIATURE DIODE TYPE QF546. 17TH INTERIM ENGINEERING REPORT, PERIOD 1 MAR TO 30 APR, UNDER CONTRACT NO. AF 33 (038)-5734 AND S5 (S51-2008), by Donald O. Holland. Raytheon Manufacturing Co., Newton, Mass. May 1952. 23p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107357

1. Tubes, Electron - Research 2. Vacuum tubes, Miniature - Research.

Report no. 1041-17. For 1st report see PB 103174, for 4th-6th see PB 102774-102776.

MEASUREMENTS ON POSTS AND IRISES IN CIRCULAR WAVEGUIDE, by R. F. Millar. National Research Council of Canada. Radio and Electrical Engineering Division. Jul 1952. 11p diagrs, graphs Available from National Research Council of Canada, Ottawa, Canada. $.25. PB 107193

The susceptances of a centrally placed post and a centrally placed iris in circular wave-guide were measured for the TE_{11} mode. In both cases, experimentally determined values of shunt susceptance were compared with existing theoretical values for rectangular guide, and good agreement was found in the case of the iris. For a fixed aperture, the iris was rotated, and measurements were made of the susceptance of the iris and polarization of the transmitted wave. NRCC 2779. NRCC ERA-230.

TRACKING PERFORMANCE ON COMBINED COMPENSATORY AND PURSUIT TASKS, by John W. Senders, Aero Medical Laboratory, and Marianne Cruzen, Antioch College. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Feb 1952. 18p diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107253

A comparison has been made between compensatory and pursuit tracking for a one dimensional visual tracking task, and the functional relationship between tracking accuracy and the nature of the tracking task has been determined for various combinations of pursuit and compensatory tracking. The results indicate that important, as well as statistically significant, differences exist between compensatory and pursuit tracking, and that accuracy of tracking increases markedly as a function of the amount of pursuit component which exists in the task. However, a tracking task which has a pursuit component of 50 percent or greater is not significantly different, in terms of time-on-target score, from a 100 per cent pursuit task. Contract W-33-038-ac-19816. AAF WADC TR 52-39.

Miscellaneous

ASIMETRICALLY DRIVEN ANTENNAS AND THE SLEEVE DIPOLE, by Ronold King. Harvard University. Cruft Laboratory. Dec 1949. 40p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107270

The problem of determining the distribution of current in and the impedance of a cylindrical antenna asymmetrically driven by a discontinuity in scalar potential is formulated. An integral equation is derived and solved by the method of successive approximations to obtain general expressions for the current and the impedance. A simple approximate expression for the impedance of the asymmetrically driven antennas is obtained. The impedance and the distribution of current for a cylindrical antenna of length 3 $\lambda/4$ driven $\lambda/4$ from one end are evaluated. The broad-band properties are discussed. Since the sleeve dipole with its image is equivalent to a superposition of 2 asymmetrically driven antennas, expressions for the impedance and distribution of current are obtained readily from the current distribution of the asymmetrically driven antenna. Both impedance and current distribution are determined for a sleeve dipole of over-all length 3 $\lambda/4$ over a conducting plane driven $\lambda/4$ from the plane. It is shown that this antenna has broad-band properties superior to those of a conventional dipole. Contract N5ori-76, Task order no. I, NR-078-011. HU CL TR 93.

CONFERENCE ON THE APPLICATIONS OF X-RAY SPECTROSCOPY TO SOLID STATE PROBLEMS, UNIVERSITY OF WISCONSIN 23-25 OCTOBER 1950, UNDER THE JOINT SPONSORSHIP OF THE WISCONSIN ALUMNI RESEARCH FOUNDATION, AND THE DEPARTMENT OF THE NAVY OFFICE OF NAVAL RESEARCH. Wisconsin Alumni Research Foundation. (1950). 82p drawings, diagrs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $2.25. PB 111087

1. Solids - Electric theory 2. X-ray analysis 3. X-ray inspection 4. Spectroscopy, X-ray 5. Spectra, X-ray 6. Spectrographic analysis 7. Spectrographs, X-ray 8. Spectrometers, X-ray 9. Mass spectrographs 10. NAVEXOS P-1033.

Contents: Notes on x-ray spectra and the theory of solids, by N. F. Mott. - Recent x-ray spectroscopic work at the University of Paris, by Y. Cauchois. - Fine structure near x-ray absorption edges of crystalline matter, by S. Kiestra. - Review of the past work in x-ray spectroscopy at Uppsala, by A. E. Sandström. - Improved energy band calculations for soft x-ray emission, by J. C. Slater. - Versatile precision bent crystal focusing vacuum x-ray spectrometer and preliminary measurements of the emission spectra of crystalline KCl, by E. L. Jossem and I. G. Parratt. - X-ray absorption structure in the K edges of gaseous Cl_2 and HCl, by S. T. Stephenson, R. Krogstad and W. Nelson. - Radiative and electronic excitation of x-ray states, by G. Schwarz, G. Rogosa. - Absorption of selenium in the soft x-ray region, by M. Parker Givens and Walter P. Siegmund. - Absorption by aluminum in the soft x-ray region, by D. H. Tomboulian. - The x-ray K absorp-

tion edges of covalently bonded Cr, Mn, Fe, and Mi, by G. Mitchell and W. W. Beeman. - New bent crystal spectrograph with high resolving power designed for the study of absorption spectra in the solid state, by A. E. Sandström. - Soft x-ray spectrometer, by C. H. Shaw. - Note on crystal suitable for double-crystal x-ray spectroscopy in the region 3-15A, by S. T. Stephenson and D. L. Martin. - Backstreaming in oil diffusion pumps, by L. G. Parratt. - Beaded wire Geiger counter for x-ray intensity measurements, by L. G. Parratt.

CURRENT AND CHARGE DISTRIBUTIONS ON ANTENNAS AND OPEN-WIRE LINES, by D. J. Angelakos. Harvard University. Cruft Laboratory. Mar 1950. 103p photos, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 107272

1. Antennas - Current distribution 2. Currents, Electric - Distribution 3. Currents, Electric - Impedance 4. HU CL TR 98.

Contract N5-ori-76, Task order no. I, NR-078-011.

DEVELOPMENT OF CONNECTOR, WATERTIGHT, 10 CONTACT. FINAL REPORT COVERING PERIOD 1 FEB 1950 TO MAR 31, 1952 UNDER CONTRACT NO. DA36-039-SC-45, by H. R. Upstone. Cannon Electric Co., Los Angeles, California. 1952. 56p photos, fold drawings Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107283

This report describes the factors entering into the design and development of new additions to and general improvement of the ten contact, watertight electric connector series currently being used by the Signal Corps for headset and microphone operation. These additions and improvements if incorporated should materially increase the versatility and overall effectiveness of this series. Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 2006-3.

DEVELOPMENT OF "Y" TYPE ELECTRICAL PULSE COAXIAL CONNECTOR. INTERIM ENGINEERING REPORT APR 1, 1951 TO MAY 1, 1951, UNDER CONTRACT NO. AF-33 (038)2135, by Julius F. Horneck. Airtron, Inc., Pleasant Plains, N. Y. Jun 1952. 15p drawings (part fold) Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107356

1. Connectors, Electric.

Report no. 6197-E.

DUAL-INPUT PARALLEL-T NETWORK, by C. F. White and K. A. Morgan. U. S. Naval Research Laboratory. Jul 1952. 14p photo, diagr, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111032

The parallel-T resistance-capacitance null-type network parted at the input and driven from two sources exhibits transfer characteristics similar to those of the basic network. The frequency of maximum attenuation becomes a function of the ratio of the input-voltage magnitudes. The instantaneous measure of a voltage-division ratio as given by the network response suggests possible computer applications. Various potentiometer-drive arrangements provide external network tuning over a wide frequency range. The frequency of maximum attenuation is varied from that associated with the basic parallel-T network by the square root of the dual-input voltage ratio. NRL R 4011.

SLEEVE ANTENNA, by John Taylor. Harvard University. Cruft Laboratory. Apr 1951. 141p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 107274

Some of the methods developed in the investigation of the center-driven antenna are applied to the sleeve antenna, a section of coaxial transmission line projecting perpendicularly from a conducting plane with the inner conductor projecting farther than the outer. This is a simple mechanical structure and can be rugged without interfering with its electrical characteristics. The projecting section of transmission line can be used as an impedance transformer to get a better match with the rest of the transmission line. The sleeve dipole is treated theoretically by a variational principle and the Ritz method is applied to obtain approximate solutions of the input impedance and of the current distribution on the structure. The measuring apparatus and methods of measurement are described. The experimental data are discussed and the theoretical and experimental results are compared. A comparison of 2 current-measuring technique, hand probe and built-in probe, is included. Integrals for the sleeve antenna are evaluated. Contract N5 ori-76, Task order no. I, NR-078-011. HU CL TR 128.

STUDY OF RADIATION PATTERNS OF SEVERAL PROPOSED HIGH-FREQUENCY COMMUNICATION ANTENNAS FOR THE "NORTH STAR" AIRCRAFT, by W. A. Cumming. National Research Council of Canada. May 1952. 32p photos, diagrs, graphs Available from National Research Council of Canada, Ottawa, Canada. PB 107194

Radiation patterns have been measured on four different high-frequency antennas mounted on a 1/32 - scale model of the "North Star" aircraft. The antennas under study were: (1) the external-wire antenna currently used on the aircraft; (2) an isolated-fin or "fincap" antenna; (3) a coupling loop recessed in a wing root; (4) two coupling loops, one recessed in each wing root. The radiation patterns of the isolated-fin antenna were far superior to those of the other antennas, there being little to choose between the external-wire and coupling-loop antennas. No direct measurements of efficiency or impedance were made, since a full-size aircraft was not available; but on the basis of the relative sensitivities of the scale-model antennas it was concluded that in these respects the isolated fin was at least as satisfactory as the external wire. It thus appears that from the electrical standpoint the isolated fin is superior to the other antennas mentioned above. The investigations described in this report were carried out under contract to Trans-Canada airlines, and are published under the authority of Mr. S. S. Stevens, Director of Communications and Electronic Development, TCA NRCC ERA 222. NRCC 2772.

THEORY OF V-ANTENNA, by Ronold King. Harvard University. Cruft Laboratory. Jan 1950. 43p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107271

An integral equation for the current in an apex-driven symmetrical V-antenna is derived and solved by successive approximations. General formulas for the distribution of current and the impedance are obtained. The zeroth-order impedance is evaluated for a leg-length h = $\alpha/4$ as a function of the enclosed angle and used to estimate experimental results. Contract N5 ori-76, Task order no. I, NR-078-011. HU CL TR 96.

UNITS & STANDARDS OF MEASUREMENT EMPLOYED AT THE NATIONAL PHYSICAL LABORATORY. III: ELECTRICITY, CURRENT, VOLTAGE, RESISTANCE, POWER, ENERGY, INDUCTANCE, CAPACITANCE, FREQUENCY, ETC. Gt. Brit. National Physical Laboratory. 1952. 17p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.25. PB 107315

1, Electricity - Gt. Brit.

S. O. code no. 48-122-3.

Food and Kindred Products

DRY GRINDING OF AGRICULTURAL RESIDUES, A NEW INDUSTRIAL ENTERPROSE, by T. F. Clark and E. C. Lathrop. U. S. Northern Regional Research Laboratory, Peoria, Illinois. May 1952. 70p photos, drawing, map, tables Available from U. S. Department of Agriculture, Northern Regional Research Laboratory, Peoria, Illinois. PB 107363

1. Agricultural residues - Uses 2. Corncobs - Uses 3. Rice hulls - Uses 4. Waste - Utilization 5. Straw pulp - Recovery from agricultural residues 6. Cottonseed hulls - Uses 7. AIC 336.

OYSTER CULTURE IN JAPAN, by A. R. Cahn. Supreme Commander for the Allied Powers. Natural Resources Section. Sep 1950. 83p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 107278

1. Oysters - Japan 2. SCAP NRS 134.

REPORT OF THE FOOD INVESTIGATION BOARD WITH THE REPORT OF THE DIRECTOR OF FOOD INVESTIGATION FOR THE YEAR 1950. Gt. Brit. Dept. of Scientific and Industrial Research. Food Investigation Board. 1952. 50p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107314

1. Food - Inspection - Gt. Brit.

S. O. code no. 47-7-0-50.

SELECTED METHODS FOR DETERMINING REDUCING SUGARS, COMPILED by John E. Hodge and Howard A. Davis. U. S. Northern Regional Research Laboratory, Peoria, Illinois. Apr 1952. 68p tables Available from U. S. Department of Agriculture, Northern Regional Research Laboratory, Peoria, Illinois. PB 107362

1. Sugar, Synthetic - Determination 2. AIC 333.

Contents: Appendix I: A. Preparation and standardization of sodium thiosulfate solutions. - B. Standardization of potassium permanganate solutions. - C. Standardization of copper sulfate solutions. - D. Preparation of starch indicator. - E. Determination of dry substance in corn sirup (CSU) samples. - Appendix II: A. Dextrose and maltose values for the Munson and Walker method. - B. Table for reducing sugars in dextrins determined by the Schoorl method. - C. Table for the determination of "true" dextrose by the modified Sichert and Bleyer method. - D. Kneen and Sanstedt's table of maltose equivalents for Dlish and Sanstedt's ferricyanide method.

TREATMENT OF DAIRY WASTE BY AERATION, by Sam R. Hoover, and Nandor Porges. U. S. Eastern Regional Research Laboratory, Philadelphia, Pa. Mar 1952. 8p tables Available from U. S. Department of Agriculture, Eastern Regional Research Laboratory, Philadelphia 18, Pa. PB 107361

1. Water - Pollution 2. Waste, Liquid - Disposal 3. Dairy products - Waste - Disposal 4. Biochemical oxygen demant test (B.O.D.) 5. Chemical oxygen demand test (C.O.D.) 6. AIC-332.

Fuels and Lubricants

CONDENSATION OF OLEFINS WITH AROMATIC HYDROCARBONS AND SUBSEQUENT OR SIMULATENOUS SULFATION OF THE CONDENSATION PRODUCT, by Dr. Frank. Anorgana G.m.b.H., Gendorf, Ger. Aug 1949. 6p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 7034t2

1. Hydrocarbons, Aromatic - Condensation products - Germany 2. Micro FIAT C15 frames 16775-16784 translation.

Translated by M. Beth, Sinclair Refining Co.

DISCUSSION OF CENTRIFUGING OF RESIDUES FROM THE COAL LIQUID PHASE. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jul 1944. 11p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 81692t

1. Centrifuges - Germany 2. Coal - Hydrogenation - Germany 3. Micro TOM 145, frames 446-452, translation.

U. S. Bureau of Mines, Office of Synthetic Liquid Fuels. Translation T-488. Translated by W. M. Sternberg.

INFLUENCE OF THE MODE OF PRECIPITATION OF CRACKING CATALYSTS ON THE PROPORTION OF GASIFICATION PRODUCTS. I. G. Farbenindustrie A. G. Oct 1950. 3p table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 81691t2

1. Catalysts, Cracking - Production - Germany 2. Micro TOM 141, frames 65-68, translation.

Translated by M. Beth, Sinclair Refining Co.

OSNOVNIYE VIVODI IZ KONTAKTNO-GIDRODINEMICHESKOI TEORII SMAZKI (BASIC CONCLUSIONS FROM THE CONTACT-HYDRODYNAMIC THEORY OF LUBRICATION GREASES), by A. E. Petrusevich. Translated by I. C. Lecompte. Jun 1952. 29p graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107389

1. Lubrication - Theory - Russia 2. Friction - Theory - Russia 3. NAVSHIPS T480 4. STS 138.

Translated from Reports of the Academy of Sciences of the USSR, Dept. of Technical Sciences, no. 2, Feb 1951, p. 209-223.

PREPARATION OF REVERSIBLE EMULSION POWDERS. I. G. Farbenindustrie A. G., Frankfurt, Ger. Aug 1949. 2p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107312t

1. Mowilith FD (Trade name) 2. Emulsions - Preparation - Germany 3. Sinclair Refining Co. Research and Development Dept. 4. Micro TOM 26, frames 3336-3338, translation.

Translated by M. Beth, Sinclair Refining Co.

USE OF UO_2 WITH AROMATIZATION CATALYSTS, by Trofimow. I. G. Farbenindustrie A. G. Oct 1950. 2p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 17664t5

1. Catalysts, Aromatization - Germany 2. Micro TOM 165, frames 492-499, translation.

Translated by M. Beth, Sinclair Refining Co. Graphs and tables provided upon request.

Highways and Bridges

APPRAISAL OF SEVERAL METHODS OF TESTING ASPHALTIC CONCRETE, by Fred J. Benson. Texas Engineering Experiment Station, College Station, Tex. Jun 1952. 83p diagrs, graphs, tables Available from Texas Engineering Experiment Station. The Texas Agricultural and Mechanical College System, College Station, Texas. PB 107288

This bulletin presents the results of a rather extensive study of asphaltic concrete test procedures. Three methods of compaction—the Marshall method, the Texas Highway Department method, and the Asphalt Institute method—were used. Six stability test procedures—the Hveem stability test, the Marshall stability test, the direct compression test, the Asphalt Institute stability test, the cohesiometer test, and a modification of the Texas Highway Department punching shear test—were studied. The primary objectives of the studies were: (1) to determine whether or not correlation existed between the various test procedures, (2) to study the effect of variations in type of aggregate, quantity of asphalt, and grade of asphalt on the various stability values, and (3) to study the effect of compaction procedure on the density of the mixtures and on the results of the stability tests. TU EES B 126.

RECOMMENDATIONS FOR BITUMINOUS SURFACINGS FOR ROADS CARRYING TRACKED VEHICLES. Gt. Brit. Dept. of Scientific and Industrial Research. Road Research Laboratory, Harmondsworth, England. 1952. 16p photos, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, New York $.30. PB 107317

1. Roads - Surface treatment - Bituminous materials - Gt. Brit. 2. Vehicles, Track - Road tests - Gt. Brit. 3. DSIR RRL RN 13.

S. O. code no. 47-141-13.

RECOMMENDATIONS FOR TAR SURFACE DRESSINGS. Gt. Brit. Dept. of Scientific and Industrial Research. Road Research Laboratory, Harmondsworth, England. Ed. 2. 1952. 12p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.25. PB 107316

1. Surfacing, Tar - Gt. Brit. 2. Roads - Surface treatment - Bitumen-tar mixtures - Gt. Brit. 3. DSIR RRL RN 1, Ed. 2.

For first edition see PB 81506. S. O. code no. 47-141-1-52.

REPORT OF COMMITTEE ON ROADSIDE DEVELOPMENT, PRESENTED AT THE 31ST ANNUAL MEETING. Highway Research Board. 1952. 101p photos, diagr, graphs, tables Available from Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $1.50. PB 107440

1. Roads - Roadside development 2. Maleic hydrazide - Use as grass inhibitor 3. NRC 222.

National Research Council publication 222.

SOIL MECHANICS FOR ROAD ENGINEERS. Gt. Brit. Dept. of Scientific and Industrial Research. Road Research Laboratory, Harmondsworth, England. 1952. 657p.photos, drawings, graphs, tables (part fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $6.75. PB 107432

1. Soil mechanics - Gt. Brit. 2. Soil stabilization - Gt. Brit. 3. Soils - Freezing effects - Gt. Brit. 4. Roads - Maintenance and repair - Gt. Brit.

S. O. Code no. 47-159.

Instruments

CATALOG, 1952. CONTROL RESISTANCES, POTENTIOMETERS, ETC. TRANSLATED AND EDITED by F. A. Raven. Gesellschaft für Elektrische Apparate und Einzelteile m.b.H., Berlin. Jun 1952. 39p photos, drawings, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107393

1. Resistors - Germany 2. Potentiometers - Germany 3. Electrical equipment - Catalogs - Germany 4. NAVSHIPS T484 5. STS 144.

DEVELOPMENT OF CENTER-OF-GRAVITY TYPE SHOCK AND VIBRATION ISOLATORS FOR AIRCRAFT ELECTRONIC EQUIPMENT. BARRY CORPORATION, WATERTOWN, MASS. FINAL ENGI-

NEERING REPORT UNDER CONTRACT NO. W33-038-AC-20475. Jul 1952. 38p drawings, graph Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107354

This report describes the development work and the final results in connection with the design of a type of shock and vibration isolator for aircraft applications. The isolators referred to here are special purpose isolators adapted to be located along the two fore-and-aft sides of the equipment, substantially in a horizontal plane extending through the center of gravity of the equipment. Certain advantages in control of natural frequency and in stability are attained when the mounts are located in such positions. Report no. 190.

DEVELOPMENT OF SUBMINIATURE HIGH TEMPERATURE CAPACITORS. SECOND QUARTERLY PROGRESS REPORT FOR PERIOD ENDING 11 JUL 1952, UNDER CONTRACT NO. AF 33 (038)-17190, SUPPLEMENTARY AGREEMENT NO. 1, PREPARED by R. S. Timm and E. Slaughter. Balco Research Laboratories, Newark, N. J. Jul 1952. 23p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107358

This project was extended to include the development of a miniature high temperature capacitor for the higher capacity (1.0 to 4 mfd.) and operating voltage ranges (400 - 1000 WVDC). The work carried on during the first quarter of the extended program for the development of miniature high temperature capacitors concerned itself primarily with the improvement of the electrical characteristics of the submitted research model capacitors. A quantity of improved units was submitted to Wright Field for evaluation during this quarter. Simultaneously, an identical group of capacitors rated at 600 BDC was placed under load-life tests at 900 VDC and 200°C. After operating for a period of over 900 hours under the above conditions, no deterioration is evident. Experimental models of these capacitors have successfully completed the full 1000 hour load-life tests with practically no deterioration noted in Q and insulation resistance. The aluminum-teflon capacitor is fully capable of extended operation at 200 C. However, since at this temperature the effects of film quality and dust particles are accentuated, great care must be exercised in capacitor fabrication, in order to keep rejects to a minimum. During this quarterly period we have concentrated on the improvement of fabricating techniques and facilities including the heat-sealing of the aluminum-teflon capacitor, capacitor winding in an air-conditioned room, and winding single dielectric units to study the quality of the film and the effects of dust particles. Results thus far obtained on 0.05 and 0.1 mfd. capacitors show a marked improvement, with a much lower reject rate. Units of this type are now under study.

GEIGER COUNTER TECHNIQUE FOR X-RAY DIFFRACTION. PART III: PARTICLE SIZE DETERMINATION FROM X-RAY LINE BROADENING, by L. S. Birks. U. S. Naval Research Laboratory. Anacostia Station, Washington, D. C. Dec 1944. 34p photos, graphs, diagr Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107374

The X-ray diffraction line broadening method of determining particle size was compared with direct measurement in the electron microscope. By controlling temperatures and heating periods, magnesium oxide particles were prepared from 50 - 1000 A. U. Sizes calculated from X-ray data taken on the N.R.L. Geiger counter spectrometer agreed to ± 10 percent with the microscope measurements. Qualitative results were obtained on specimens containing a wide range of particle sizes. Problem no. H-75. For Parts I-II see PB 107203-107204; for Parts 4-5 see PB 107375-107376. NRL H 2434.

GEIGER COUNTER TECHNIQUE FOR X-RAY DIFFRACTION. PART IV: DETAILED CONSIDERATION OF EXPERIMENTAL CONDITIONS, by L. S. Birks. U. S. Naval Research Laboratory. Apr 1945. 44p photos, drawings, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107375

Detailed consideration is given to the experimental conditions affecting the results of powder diffraction measurements with the N.R.L. Geiger counter spectrometer. These conditions include the shape and position of the specimen, the size of the apertures defining the beam, the method of preparation of the specimen, the characteristics of the Geiger counter, and the speed of automatic scanning. For Parts I-II see PB 107203-107204; for Pt. III see PB 107374; for Pt. V see PB 107376. NRL H 2517.

GEIGER COUNTER TECHNIQUE FOR X-RAY DIFFRACTION. PART V: PARTICLE SIZE DETERMINATION FROM SMALL ANGLE SCATTERING, by L. S. Birks. U. S. Naval Research Laboratory. Jul 1946. 26p photos, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107376

The small angle scattering method of A. Guinier and the X-ray refraction method of R. von Nardroff were compared with the line broadening methods of von Laue and others. At the Bragg angle, the Laue intensity equation may be expressed by

$$I = I_{max}\, e^{-\frac{\pi}{\lambda^2} L^2 \Delta^2 \cos^2 \theta}$$

At zero angle, the Guinier intensity equation may be expressed

$$I = I_{max}\, e^{-\frac{3}{3} \frac{2}{2} L^{-2} \Delta^2}$$

where the particles are not necessarily crystalline. R. von Nardroff considered not the scattering, but the refraction of the unscattered beam and related the broadening of the rocking curve of a double crystal spectrometer to the size of the refracting particles. Experimental results on a specimen of MgO, whose particle size distribution was known, indicated that the guinier method and the line broadening method gave comparable results, but the von Nardroff method was not applicable to particles of the order of a few hundred angstroms in diameter. It was found that the particle size distribution could be synthesized approximately from the small angle scattering curve by a method reported by Jellinek, Solomon, and Fankuchen. Problem no. H-75. For Parts I-II see PB 107203-107204; for Parts III-IV see PB 107374-107375. NRL H 2881.

HETERODYNE FILTER, by Gunnar Fant. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1952. 79p photo, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107409

A heterodyne filter is described. It can be used as a band pass filter of any combination of two cut-off frequencies within the 40—4000 p/s frequency range. Bandwidth and low frequency cut-off are continuously varied by separate controls, which is a useful feature for wave analyzer applications. Band elimination filtering can also be obtained. The system is based on successive filtering in a number of single sideband transmission units in which the carrier frequencies control the relative positions of filter cut-offs. An analysis is made of square low vacuum tube modulation, specially with regard to negative feedback in balanced modulators. Acta polytechnica 104(1952) Electrical engineering series vol. 4, no. 6. Also issued as Kungl. Tekniska Högskolans Handlingar nr. 55. Acta polytechnica 104.

INVESTIGATION OF FIELDISTOR PRINCIPLES. INTERIM ENGINEERING REPORT NO. 12, MONTH OF JUNE 1952, UNDER CONTRACT AF 33 (038)-23297, by C. Orman. Sylvania Electric Products, Inc. Physics Laboratories, Bayside, N. Y. 1952. 22p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107443

The purpose of this project is to study and improve the fieldistor, a device similar to the transistor but having high input impedance. A large electric field is used to control the back-current of a germanium diode. Controlling voltage is applied to electrodes spaced closely about a point contact, but not touching the germanium wafer. Project 1213-1415, report YD51-11.

ORDVAC MANUAL. Illinois. University, Urbana, Ill. 1952. 414p photos, diagrs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Photostat $52.50. PB 107241

1. Computers, Electrical - Design.

Contract DA-11-022-ORD-680. Machine constructed for Ballistic Research Laboratories, Aberdeen Proving Ground. ORD Project TB3-007J.

PULSED GEIGER TUBE OPERATION, by S. W. Lichtman. U. S. Naval Research Laboratory. Jul 1952. 19p photos, graph Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111035

Operation of a Geiger tube from a periodic pulse voltage furnishes a means for extending its range of intensity measurement beyond the limits normally encountered with dc operation. The periodic pulse may either augment the dc Geiger region voltage or it may serve as the sole exciting potential for the counter tube. In either event, the range will be extended in proportion with the factor t_d/w, where t_d is the counter-tube dead time and w is the injected pulse width. For triggered operation at high overvoltages, involving large ratios of t_d/w, a region exists in which the charge-per-count pulse is maximized and the counter tube current becomes substantially independent of the operating voltage. Either linear or nonlinear radiation detection may be attained by measurement of an appropriate counter circuit parameter and by suitable shaping of the triggering pulse. NRL R 4013.

RECORDING PHOTOMETER AND ACCOMPANYING APPARATUS FOR USE IN MEASUREMENT OF REACTION KINETICS, by Harold Kwart and Chiahchih Yang. Harvard University. Cruft Laboratory. Feb 1950. 32p diagrs, graph, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107269

An apparatus is described which affords automatic recording of fractional light transmission and hence of reagent concentrations during reaction kinetic studies. The reagent concentrations are followed by means of double beam spectrophotometry. The instrument is provided with apparatus for initiating photochemical chain reactions and affords conditions for rotating-sector measurements during spectrophotometric observations. Data are presented on the performance, sensitivity, and precision of measurement. Technical report no. 3 under Project no. NR-056-095, Contract no. N5ori-76, Task XX, period 1 Sep 1948-1 Oct 1949. HU CL TR 3.

SINGLE-CORE MAGNETIC AMPLIFIER AS A COMPUTER ELEMENT, by R. A. Ramey. U. S. Naval Research Laboratory. Aug 1952. 13p photo, diagrs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111033

It has been found possible to develop new basic circuitry, using only magnetic amplifiers, which will perform the fundamental operations of logic necessary in present-day digital computers. The design objective of obtaining high-speed operation is well satisfied; the circuits respond to information presented at twice the frequency of the carrier signal. The basic unit used to construct a coincidence counter is very similar to the newly developed NRL magnetic amplifiers, except that several parallel input circuits are added. Cascading of similar circuits produces a magnetic ring counter and a two-stage flip-flop into which circulating pulses can be programmed. For programming the ring counter an "OR" circuit was developed which allows either of two signal sources to actuate the programming stage. NRL R 4030.

WEIGHING VEHICLES IN MOTION, PRESENTED AT THE THIRTY-FIRST ANNUAL MEETING, by O. K. Normann and R. C. Hopkins. Highway Research Board Jan 1952. 35p photos, diagrs, graphs, tables Available from Highway Research Board, National Research Council 2101 Constitution Ave., Washington 25, D. C. $.45. PB 107285

This paper describes development of an electronic weighing device which can measure axle weights, axle spacings, and speeds of vehicles moving at their normal speeds along highways. The device consists of a narrow, free platform built in the surface of a traffic lane and supported by load cells containing columns to which are affixed groups of wire strain gages. The weight applied to the platform by a vehicle passing

over it produces changes in the electrical currents flowing through the strain gages, and these changes, through electronic equipment, are reproduced as a pattern of light on an oscilloscope, where they are photographed for record purposes. HRB BUL 50.

Machinery

DRAWINGS OF THE LURGI PRESSURE GASIFICATION PLANT AT B.K.W. BÖHLEN GAS WORKS FOR GASIFICATION OF BROWN COAL. BRAUNKOHLEN-UND GROSSKRAFTWERK, BÖHLEN, GER. TRANSLATION OF TITLES OF DRAWINGS IN REEL 137. n.d. 3p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107238t

1. Lignite - Gasification - Germany 2. Lignite - Production machinery - Germany 3. Micro TOM 137 index, translation.

SPEED REGULATION OF SLIP-RING INDUCTION MOTORS FOR SPECIAL PURPOSES, by F. Dahlgren and P. Biringer. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1951. 40p photos, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107406

A theoretical and experimental investigation has been carried out relating to a particular arrangement for speed regulation of a slip-ring induction motor within certain regions of operation, which are of special interest for industrial applications. These regions of operation are high speed service at low torque, where the arrangement renders over-synchronous motor operation possible, further low speed motor service and low speed reverse-field braking, both at full torque. Acta polytechnica 99(1951) Electrical engineering series vol. 4, no. 4. Also issued as Kungl. Tekniska Högskolans. Handlingar nr. 53.

Medical Research and Practice

ANTHROPOMETRY OF THE FOOT (U. S. ARMY WHITE MALE), by Francis E. Randall, Ella H. Munro, and Robert M. White. U. S. Climatic Research Laboratory, Lawrence, Mass. Jan 1951. 26p diagrs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111025

1. Foot - Measurements 2. Army - Anthropometry 3. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Environmental Protection Section 4. QMC EPS 172.

Project 7-64-02-001.

BEHAVIORAL CHANGES FOLLOWING RADIATION II: MATERNAL BEHAVIOR AND MAZE PERFORMANCE, by C. Downing Tait, Jr., Patrick D. Wall, Muriel Balmuth, and Sylvan J. Kaplan. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1952. 14p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.00. PB 107347

Groups of white rats in their final week of pregnancy were exposed to single doses of 30, 90, 180, and 360 roentgens (in air). Only the heaviest exposure produced apparent deterioration in maternal behavior when compared with controls. Growth disturbance in offspring was correlated positively with size of dose. Both 90 r and 180 r offspring made significantly more maze errors than controls. AAF SAM Proj. Sepcial report.

DISCRIMINATORY ANALYSIS-NONPARAMETRIC DISCRIMINATION: SMALL SAMPLE PERFORMANCE, by Evelyn Fix, and J. L. Hodges, Jr. U. S. Air Force. School of Aviation Medicine. Randolph Field, Texas. Aug 1952. 45p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107353

A classification procedure is worked out for the following situation: Two large samples, one from each of two populations have been observed. An individual of unknown origin is to be classified as belonging to the first population if the majority of a specified odd number of individuals closest to the individual in question belong to the first population. This method has optimum properties when the number of closest individuals is permitted to be very large. For certain cases involving multivariate normal distributions with the same covariance matrix, the probabilities of possible misclassification have been computed and compared with those of the discriminant function method. AAF SAM Proj. 21-49-004, Report no. 11.

EFFECT OF FLASHES OF LIGHT ON NIGHT VISUAL ACUITY, by Glenn A. Fry and Mathew Alpern. Ohio State University Research Foundation, Columbus, Ohio. Nov 1951. 53p graphs, drawings, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107338

The purpose of the study was to find out the ability of the eye to see a dark object against a sky background at night after the eye had been exposed to a flash of light or a series of flashes. The major phase of the investigation was concerned with the effect of adapting to various levels of retinal illuminance the portion of the retina on which the image of the test object falls. It has been found in this phase of the study that a reciprocity exists between time and intensity of stimulation within a three-second interval, that is, the effect is dependent upon the product of time and intensity. The second phase of the study deals with the effect of non-uniform distributions of brightness in the field of view. Contract no. AF 33(038) 15630. For Part 2 see PB 107339. AAF WADC TR 52-10, Part 1.

EFFECT OF FLASHES OF LIGHT ON NIGHT VISUAL ACUITY, by Glenn A. Fry and Merrill J. Allen. Ohio State University Research Foundation, Columbus, Ohio. Nov 1951. 41p photo, drawings, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50,

Photostat $6.25. PB 107339

The investigators have attempted to work out a method and to acquire the necessary data for predicting the course of constriction of the pupil of the dark adapted eye produced by a flash of any duration or a series of flashes involving a complex changing distribution of brightness in the field of view. Contract no. AF33(038)-15630. For Part 1 see PB 107338. AAF WADC TR 52-10, Part 2.

ELECTRODYNAMIC MICROPHONISM IN HIGH-SENSITIVITY, SUB-AUDIO FREQUENCY MEASUREMENTS: A NOTE ON VIBRATION ARTIFACTS IN MAGNETIC ENVIRONMENTS AND D-C BIAS IN FLYING LABORATORY MEASUREMENTS AND ROCKET TELEMETRY, by J. W. Prast. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 12p diagr, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107352

In free-field measurements, the electrodynamic component of vibratory cable microphonism is negligible in comparison to the intensity of the electrostatic component known to interfere with the recording of EEGs during motion. Within magnetic fields of higher flux density than terrestrial magnetism, it is possible that artifacts of considerable amplitude will be generated in vibrating conductors. High-sensitivity measurements during high-velocity motion of rockets and other instrument carriers may become handicapped by the generation of d-c potentials modulated with low frequencies. AAF SAM Proj. 21-38-001, Report no. 3.

OTITIS EXTERNA: BACTERIOLOGICAL AND MYCOLOGICAL STUDIES, by David E. Singer, Elizabeth Freeman, Warren R. Hoffert, Reginald J. Keys, Roland B. Mitchell, and Albert V. Hardy. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jun 1952. 20p tables Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $1.75, Photostat $2.50. PB 107350

Cultures from 1,377 normal and 646 infected external auditory canals were examined bacteriologically and mycologically. Pseudomonas, other gram-negative bacilli, and streptococci were identified rarely from the normal but frequently from the infected ears. There was no increase in prevalence of other bacteria in the infected ears. The Pseudomonas group of organisms appeared to be the most important etiological agent, but other gram-negative bacilli and streptococci evidently had etiological significance also. Mycological flora was sparse and diverse and appeared to have limited etiological significance. In vitro sensitivity tests performed on all bacteria isolated pointed to terramycin and sulfadiazine as the drugs of choice for otitis externa. Initial cultures and sensitivity studies are indicated to guide therapy in the less typical cases. Contract no. AF 33(038)-12465. Contents: - Appendix I: Supplementary table I. - Appendix II: Review of the literature on bacterial infections of the external ear, by Warren R. Hoffert and David E. Singer. - Appendix III: Review of the literature on "otomycosis", by Elizabeth Freeman. AAF SAM Proj. 21-35-006, Report no. 2.

Metals and Metal Products

ALUMINUM INDUSTRY IN THE UNITED STATES WITH EMPHASIS ON INDUSTRIAL MOBILIZATION PLANNING, by Anthony J. Maurel. Columbia University. School of Business, New York, N. Y. Sep 1949. 66p diagr, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107319

A study was made of the aluminum industry to demonstrate some of the major problems of developing an industrial mobilization plan by making a case study of a small industry vital to national defense. First, a consideration of the general background of the industry to include a brief history, stages of aluminum production, and uses for aluminum are considered. Second, developments are considered relative to the developments in the industry resulting from World War II, including the period prior to the war, during the war, and after the war. Finally, the planning objectives for the aluminum industry to include objectives, agencies, methods, and outlook for the future are discussed.

COMPARISON OF THE HIGH-TEMPERATURE PROPERTIES OF ML ALLOY AND 142 ALLOY AT ROOM TEMPERATURE, 400°F., AND 600°F. FINAL REPORT UNDER CONTRACT W33-038-AC-19061 (18890), by C. M. Craighead, L. W. Easton, C. H. Lorig, and H. C. Cross. Battelle Memorial Institute, Columbus, Ohio. Sep 1948. 20p graphs (part fold), tables (part fold) Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $1.75, Photostat $2.50. PB 107257

A final report is presented on the comparison of the high-temperature properties of ML alloy and 142 alloy at room temperature, 400°F, and 600°F. The tensile properties of 142-T61 and the ML alloys have been compared at room temperature, 400°F, and 600°F. Their creep properties have been compared at 400° and 600°F. Both alloys were stabalized 72 hr at 400°F before testing at 400°F, and 48 hr at 600°F before testing at 600°F. The tensile properties of the 142-T61 at room temperature and at 400°F are somewhat superior to ML alloy. At 600°F the tensile and yield strengths of the ML alloy are about 2000 psi higher than 142 alloy. The creep properties of 142-T61 are slightly better than ML alloy at 400°F, but at 600°F the ML alloy has the better resistance. At a minimum creep rate of 0.0002% per hr, 142-T61 alloy will support a load of 2500 psi, whereas ML alloy will support a load of about 4100 psi.

DEVELOPMENT OF SHEET MATERIALS FOR HIGH TEMPERATURE APPLICATIONS, by Joseph D. Meierdirks and Dr. Gunther Mohling. U. S. Air Materiel Command. Engineering Division. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1948. 38p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107255

Tests were run on 48 alloys in order to develop a sheet material for high temperature applications which would meet the stress-rupture specifications of a 100 hour life at 1700°F, 12000 psi and 1800°F, 6000 psi. One alloy, V-36, consisting of .25 C, .80 mn, .50 Si, 25 Cr, 20 Ni, 44 Co, 4 Mo, 2 W, and 2 Cb, fully meets the contract strength specifications, while several others miss this strength level by a slight margin. High tungsten alloys such as V-22 gave very high results in bar stock and very poor results in sheet form. Higher chrome alloys such as V-36 on the other hand gave intermediate results in bar stock, while results in the sheet form were actually higher. Good properties on materials in which nickel has been substituted for cobalt have not been obtained so far. Final report submitted by Allegheny Ludlum Steel Corporation under Contract W33-038-ac-16519. AAF TR 5731.

FURTHER BALL MILLING STUDIES ON PURE OXIDES, by Louis R. McCreight. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Oct 1949. 12p graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107261

Data on the effects on compressive strength of fine milling and the blending of various fine particles of pure oxides are presented together with data on hydrostatically pressed specimens of alumina. It was shown that strength values for magnesia can be improved by milling the electrically fused raw material in a nonaqueous medium, such as ethanol. High strength with greater ease of forming can be obtained by blending different particle sizes of finely milled materials. Specimens pressed hydrostatically at the optimum pressure will show less warpage, better strength, and will have lower firing temperatures than those produced by other methods. Report prepared by University of Illinois, Dept. of Ceramic Engineering, under Contract W33-038-ac-14520.

MODES IN WAVEGUIDES THAT CONTAIN FERRITES, by M. L. Kales. U. S. Naval Research Laboratory. Aug 1952. 13p Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111038

When a stationary magnetic field is applied in the longitudinal direction to a waveguide containing a ferrite material, the medium within the guide becomes anisotropic. Polder demonstrated that when a microwave field is propagating within such a medium, the relation between B and H is given by $B_x = \mu H_x - \mu' H_y$, $B_y = j \mu' H_x + \mu H_y$, and $B_z = \mu_z H_z$ where μ, μ' and μ_z depend on the stationary magnetic field. Using these equations, an investigation is made of the waveguide modes. Formal solutions are obtained for guides having circular symmetry; these depend on some rather involved eigenvalue equations which determine the propagation constants. NRL R 4027.

PHASE COMPOSITION OF ALUMINIUM DI-ABIETO-ABIETIC ACID CO-PRECIPITATES. STUDIES ON ROSIN SIZING, by Ernst Back. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1952. 3p graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107368

1. Aluminum abietates - Sweden 2. Abietic acid - Determination - Sweden 3. Alloys, Binary - Equilibrium diagrams - Sweden 4. Aluminum diabietate-abietic acid compounds - Equilibrium diagrams - Sweden 5. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 90.

Summaries in German and Swedish.

PROTECTIVE COATING OF MOLYBDENUM, by A. M. Suggs, P. R. Mallory & Company. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1949. 28p photos, diagr, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107259

The final report is presented on experiments carried out to find a protective coating for molybdenum which would prevent its oxidation in air at temperatures up to 3000°F. Specimens of molybdenum were covered with aluminum, nickel, magnesium, and titanium and oxidized by heating in air, but the protection was not lasting. Results are given for different ceramic coatings and for various methods of applying the coatings. The most satisfactory coatings obtained were eutectic mixes of MgO, SiO_2 and Al_2O_3. Report no. 7, final report for period Jan 28, 1948 to Jan 28, 1949 under Contract W33-038-ac-19697, Item 1. AAF TR 5897.

REFRACTORY METAL REINFORCED SUPER ALLOYS, by J. M. Krol and Claus G. Goetzel, Loewy Research & Development Division. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. May 1949. 29p photo, graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107258

The results of an investigation regarding the development of heat resistant alloys by means of the infiltration of heat and corrosion resistant metals or alloys into a skeleton body of a refractory metal or alloy, are presented. It was also desired to develop techniques for the production of specific components from the materials developed, which can be translated into mass production practices. The composite structures produced were examined for soundness by macroinspection, microscopic examination, and density tests; general physical properties were determined from hardness and modulus of rupture in transverse break testing at room and elevated temperature. Of the combinations with the refractory metals molybdenum and tungsten as major constituents, only tungsten alloys with chromium, infiltrated with nickel-base alloys, showed promise. Of the refractory compounds considered in the investigation, titanium carbide-base composites are most promising. Final report under Contract W33-038-ac-19710 (19354). AAF TR 5892.

SEARCH FOR NEW RESISTIVE MATERIALS FOR HIGH-STABILITY, HIGH-TEMPERATURE-OPERATING RESISTORS. ELEVENTH QUARTERLY INTERIM ENGINEERING REPORT, PERIOD APR 10, 1952 TO JUL 10, 1952, UNDER CONTRACT NO. AF-33 (038)-8744, by E. R. Olson and A. E. Middleton. Battelle Memorial Institute, Columbus, Ohio. Jul

1952. 21p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107355

The results of studies show that the properties of the Cr-N films are more than slightly dependent on the characteristics of the ceramic base. This is particularly true for thin films which exhibit the desired low temperature coefficients of resistance and high resistances. Life-test data at high ambient temperatures, temperature coefficients of resistance at subzero temperatures, and effects of spiralling on the temperature coefficient all tend to substantiate the importance of the base and show that a base better than that presently being used is required. The property evaluations indicate that the thin, high-resistance Cr-N films are more subject to resistance changes due to oxidation than the thicker, low-resistance Cr-N films. Analytical information from both chemical and X-ray studies reveals that conversion to Cr_2N occurs at the high temperatures and Cr_2N + CrN at the lower temperatures. Other thermochemical data on the Cr-N system are discussed. For earlier reports see PB 101978 and supplements.

TAGEBUCH DES BESUCHES IM LAUTAWERK (DIARY OF A VISIT TO THE LAUTA WORKS), by O. O. Kruk. Translated by Bart Landheer. May 1952. 8p diagr Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107388

1. Aluminum - Production - Germany 2. Bauxite - Reduction - Germany 3. NAVSHIPS T 478 4. STS 140.

TITANIUM-MANGANESE, TITANIUM-TUNGSTEN, AND TITANIUM-TANTALUM PHASE DIAGRAMS, by R. I. Jaffee, L. W. Eastwood, D. J. Maykuth, R. M. Goldhoff, H. R. Ogden, J. W. Holladay, J. G. Kura. Battelle Memorial Institute, Columbus, Ohio. Jun 1951. 61p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107335

Investigations were carried out on the phase diagrams for the binary alloy systems of Ti-Mn, Ti-W, and Ti-Ta using both iodide titanium and Process A titanium metal bases. Work to date has largely been restricted to the titanium-rich alloys prepared by arc melting. Studies were carried out, where possible, on alloy strip fabricated from the ingots by hot rolling. Metallographic, X-ray diffraction, and resistance-temperature methods were used in the investigation, and tentative diagrams for the three alloy systems have been constructed from these data. The alloy systems of manganese, tungsten, and tantalum with iodide titanium are similar to those found using Process A titanium. In general, the beta transus is slightly higher, and the alpha transus lower, with Process A alloys than with iodide-base alloys. Manganese shows a limited solubility in alpha titanium and an extended solubility in beta titanium. The beta transus is lowered by additions of manganese, and at around 25 per cent, the beta field is restricted by the formation of an intermediate phase. Work with iodide titanium indicates that the beta phase forms a terminal solid solution. Preliminary work on higher manganese alloys shows that several other intermediate phases exist in this system. Work with both bases indicates that beta titanium is isomorphous with both tungsten and tantalum. The solubility of tungsten in alpha titanium is restricted to about 2 per cent down through 570°C., while tantalum is soluble to at least 10 per cent at 700°C. Contract no. AF 33(038)-8544. AAF TR 6516, Pt. 1.

UTILIZATION OF LOW ALLOY MATERIALS FOR HIGH TEMPERATURE SERVICE APPLICATIONS, by James Miller, L. W. Smith, Phillip K. Porter. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1949. 65p photos, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107260

Six SAE steels, six special ferritic steels and five stainless steels were examined in order to determine the feasibility of using these alloys for applications involving exposure to high temperatures for short periods of time. The effect of heat treatment on the high temperature properties was investigated. At constant temperature, the elongation under constant loads which produced elongations up to 10% in times ranging from 2 min to 100 hr, was measured. While the annealed condition, in general, afforded greatest resistance to relatively long time creep, it was determined that an increase in short-time strength could be made by quenching and drawing at the proper temperature. Other treatments were found to improve the short-time strengths of stainless steels. Greater high-temperature strengths were exhibited by steel containing small amounts of nitrogen or boron and titanium. Prepared by Cornell Aeronautical Laboratory, Inc. under Contract W33-038-ac-21094. AAF TR 5929.

V-36 ALLOY: DETERMINATION OF DESIGN DATA, by Ward F. Simmons, Battelle Memorial Institute, Columbus, Ohio. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. May 1950. 18p graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107262

Creep and creep-rupture tests were conducted on V-36 alloy sheet to obtain suitable data from which design curves could be prepared. The chemical composition of V-36 alloy and results of tests conducted at temperatures of 1350°, 1500°, 1700°, and 1800°F are given. Curves for 0.1, 0.2, 0.5, 1.0, and 3.0% deformation were plotted for each temperature to facilitate use of V-36 alloy in designs where relatively high strength is needed in the 1700°-1800°F temperature range. The stresses to produce rupture in 100 hr at the various test temperatures are listed. Report prepared by Battelle Memorial Institute under Contract AF 33(038)-956, covering the period June 15-Dec 20, 1949. AAF TR 5949.

Ordnance and Accessories

MULTIPLE IMPULSES OF UNDERWATER EXPLOSIONS. Woods Hole Oceanographic Institution, Woods Hole, Mass. Sep 1941. 17p graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107437

1. Explosions, Underwater - Pressure measurements.

Listed in Catalog of OSRD reports as no. 8337.

Paper and Allied Products

APPLICATION OF THE KUBELKA-MUNK THEORY TO THE DIFFUSE REFLECTION OF LIGHT FROM PAPER, A CRITICAL STUDY BY Ake S: son Stenius. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 17p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107367

1. Light - Reflection - Sweden 2. Light - Absorption - Sweden 3. Paper - Reflectivity - Sweden 4. Kubelka-Munk theory (Light reflection) 5. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 78.

Summaries in English, German and Swedish. Reprinted from Svensk papperstidning 54 (1951) p. 663-670. Presented in part at the annual meeting of the Swedish Association of Paper and Cellulose Engineers (SPCI), Stockholm, Feb 28, 1951.

CONSIDERATION ON THE RESISTANCE OF FILTER PAPER TO DISSOLUTION, by Hans Wilhelm Giertz and Gunnar Gran. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1952. 6p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107369

1. Filter paper - Solubility - Sweden 2. Svenska Träforskningsinstitutet-Träkemi och Pappersteknik. Meddelande 94.

Summaries in German and Swedish. Reprinted from Svensk papperstidning 55 (1952) p. 38-43.

ELECTRICAL PROPERTIES OF PENTACHLORDIPHENYL-IMPREGNATED GLASS FIBER PAPER, by T. D. Callinan. U. S. Naval Research Laboratory. Jul 1952. 11p photo, diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111030

In an effort to determine the effectiveness of glass fiber paper when used as a thermally stable dielectric in capacitors, a study was made of the electrical properties of the glass, the impregnant, the glass fiber paper, and the impregnated paper. The dielectric constant of Pyrex-E glass was found to be 6.1 to 6.5 over the temperature range -60° to 120°C at 60, 1000, and 10,000 cycles. The loss factor under similar conditions was 0.01 to 0.3. Glass fiber paper has a dielectric constant of 1.07 and a loss factor of 0.0001 to 0.0005. These values are in agreement with Endicott's equations. When impregnated with pentachlordiphenyl (dielectric constant, 3.0 to 5.5; loss factor 0.05 to 1.0), the electrical properties of the glass fiber paper are lower than those predicted by the equations. It would seem that these equations may be employed to predict the upper limit to be expected in loss factor from a combination of impregnants. NRL R 4019.

Personnel Aptitude Testing

INDIVIDUAL DIFFERENCES IN CRITICAL AIRCREW ELEMENTS. I. THE DETERMINATION OF CRITICAL PROFICIENCY REQUIREMENTS OF B-29 COMBAT CREWS, by Francis W. Marley. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1952. 20p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107348

Data on aircrew performance were obtained by analysis of already existing evaluation forms, from study of technical aircrew literature, through individual and group interviews with flying personnel, by analysis of bombardment wing gross error board reports, and through reference to critical incidents obtained in a previous study. These data were integrated and utilized to develop tentative lists of proficiency evaluation items for each of seven B-29 aircrew positions. Subsequently arrangements were made to obtain, through judgments by qualified experts, information regarding the relative importance of the various items. Contract no. AF 33(038)-10476. Appendix A: Revised instructions for item-importance judges. - Appendix B: Tentative item-list for bombardier check. AAF SAM Proj. 21-29-014, Report no. 1.

PRELIMINARY STUDY OF THE POWER-SPECTRUM APPROACH TO THE ANALYSIS OF PERCEPTUAL-MOTOR PERFORMANCE, by Ezra S. Krendel. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Oct 1951. 46p photos, graphs, table Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107342

Quantitative information about human frequency response functions in the control of a piloted aircraft would provide a rational basis for stability and control criteria. The amplitude part of the transfer function for a linear time invariant system over a particular bandwidth is the square root of the ratio of the power spectrum of the output to the power spectrum of the input. The applicability of this method for determining the transfer function was studied at The Franklin Institute using one subject and a tracking task having some similarity to an aircraft control problem. Although the procedures used to determine the power spectra were of low accuracy, the results indicate that the power spectrum approach shows promise of yielding useful information about human responses in a tracking problem. Several amplitude ratios were determined, but these curves cannot be considered definitive results at this time. Contract no. AF 33(038)-10420. AAF TR 6723.

PSYCHIATRIC SCREENING OF FLYING PERSONNEL. IV: AN EXPERIMENTAL INVESTIGATION OF DEVELOPMENT OF AN EEG INDEX OF ANXIETY TOLERANCE BY MEANS OF PHOTIC STIMULATION-ITS VALIDATION BY PSYCHOLOGICAL AND PSYCHIATRIC CRITERIA, by George A. Ulett, Goldine

TECHNICAL REPORTS News letter

PUBLISHED MONTHLY

U. S. DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES
WASHINGTON 25, D. C.

NO. 40, OCTOBER 1952

FIRE-RETARDANT TEXTILES

The latest technical know-how for fire retardant treatment of textiles is summarized in a report which presents the results of a 3-year research project carried on at Columbia University for the Army Quartermaster Corps.

Entitled "Fundamental Studies of Chemical Retardants for the Fire Resistant Treatment of Textiles", this 308-page report includes a number of fundamental studies into the physical phenomena which occur when cellulosic materials are burned and the process by which various chemicals prevent this burning action. This basic knowledge has enabled the textile industry to produce, for the Quartermaster Corps, flame-resistant treated textiles lighter in weight and more flexible than those available during World War II.

Among the studies reviewed in the report are: The Thermal Decomposition of Cellulose; Rates of Degradation of Flameproofed Fabrics; The Insulation Value of Flameproofed Fabrics to Incident Heat or Flame; Composition of the Tarry Products from the Thermal Decomposition of Cotton; Volatile Decomposition Products from Fabrics and Their Relation to Flameproofing; Chemical and Physical Properties of Flameproofing Agents; Investigation of the Foaming Tendency of Inorganic Mixtures upon Heating as a Physical Mechanism of Flameproofing; Exploratory Investigations of Flameproofing Agents.

PB 111007, Mimeo., $7.75. Order from OTS. See Instructions, page 4.

BETTER CLOTHING INSULATION

Textile-fiber battings used as insulating material in clothing derive their insulating value from the pockets of air caught between fibers. To prevent compression of the fibers, hence loss of insulating value in such materials, the Army Quartermaster Corps developed a corrugated form of batting which has high resistance to compression.

A research report entitled "Corrugated Fibrous Webs as Insulation Fillers" describes methods of producing corrugated fibrous battings and their characteristics as insulators, and concludes that corrugated battings can be produced by simple modification of conventional machinery.

PB 111003, Mimeo., $.75. Order from OTS. See Instructions, page 4.

THE NEWSLETTER is a monthly digest of outstanding technical reports available to business firms and laboratories from Federal and other nonconfidential research sources. Special emphasis is placed upon items of interest to smaller business firms. The Newsletter may be purchased as part of the Bibliography of Technical Reports (subscription price, $5 per year) or separately (50c per year).

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Your U. S. Department of Commerce Field Office can be of assistance to you in placing orders or obtaining technical advice. A list of field office addresses is available from the U. S. Department of Commerce, Washington 25, D. C.

SAVING SCARCE MATERIALS. How to stretch the supply of materials that are critical for defense production--especially metals and plastics--is discussed in a report by a British productivity team which surveyed metal working and allied industries in the United States. Of particular interest is a comprehensive chapter entitled, "Detailed Discussion, Material by Material," which reviews the conservation picture and recommends conservation measures for ferrous metals, nonferrous metals, and plastics. Also valuable is a chapter which presents "Principles of conservation" based on: (1) Design alterations; (2) manufacturing methods. PB 106457, 70 pages, $1.00. Order from OTS. See Instructions, page 4.

INSECT CONTROL. A time saving guide to the advances in insect control is provided in a literature survey of "insects that carry diseases to man and their control," prepared by the Army Quartermaster Corps.

The survey starts with the arrival of DDT on the scene as an insecticide in 1944 and includes 176 references, most with abstracts. Separate sections are devoted to bedbugs, flies, lice, mites, mosquitos and ticks. Especially valuable are sections on: (1) Insecticide treatments of textiles and clothing; and (2) insecticide toxicity to man. PB 106653, Mimeo., $1.75. Order from OTS. See Instructions, page 4.

MEASURING HUMIDITY ELECTRICALLY. To develop a device which measures the humidity in the upper atmosphere and reports it to earth by radio, the Signal Corps conducted a research project to achieve a reliable, sensitive, carbon element which changes resistance with moisture. The final report on this contract discusses the manufacturing procedure, raw materials, composition, and performance of the element. PB 106658, Microfilm, $2.00, Photostat $3.75. Order from LC. See Instructions, page 4.

LOGARITHMIC ATTENUATOR. To obtain a single instrument which can measure, with equal accuracy, large signals in the order of thousands of volts or small signals of small fractions of a volt, Naval Research Laboratory scientists developed an electronic "attenuator" which gives an output voltage proportional to the logarithm of the input voltage. For details, see PB 106745, Mimeo., $.25. Order from OTS. See Instructions, page 4.

CORROSION PROTECTION — FOR AND WITH MAGNESIUM

Magnesium Coating and Corrosion (Including Cathodic Protection) is the title of a bibliography prepared by the Army Quartermaster Corps which contains latest articles and patents on methods of protecting magnesium against corrosion. Also covers cathodic protection methods for using magnesium to prevent corrosion of other metals. Contains 173 items, most of them with abstracts, covering the period 1946-1951. Includes also references for coloring magnesium and one reference on spray-plating steel onto light metals to give them a hard wearing surface. PB 106654, Mimeo., $1.00. Order from OTS. See Instructions, page 4.

ELECTROMETRIC TESTING OF BLOOD

A new electrometric method of testing the cholinesterase activity of red cells and of plasma, developed by the Army Chemical Corps Medical Laboratories, requires less equipment, is simpler and faster than the standard manometric method, and is just as reliable.

In this new method the enzymatic release of acetic acid from acetylcholine is measured in units of pH change per hour, in a solution of standard buffer capacity. The new method is fast and simple enough to be used for large scale blood testing and is applicable to testing blood of all animals. PB 106777, Microfilm $1.75, Photostat $2.50. Order from LC. See Instructions, page 4.

TOWARD CARBON-FREE MOTOR FUELS

Addition of non-hydrocarbon to hydrocarbon motor fuels helps reveal the mechanism of carbon formation during combustion of the fuel. How halogen compounds (aliphatic iodies, bromides, and chlorides) help reveal the mechanism of carbon formation in gas turbine fuels is discussed in a research report by the National Aeronautical Establishment of Canada. Report also describes a new, simple method of testing the tendency of motor fuels to produce carbon.

Mimeograph copies available on exchange basis from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. Order by Title: "Effect Of Aliphatic Halogen Compounds On Carbon Deposition From Aircraft Gas Turbine Fuels." For microfilm print ($1.75) or photostat copy ($2.50), order PB 106582 from LC. See Instructions, page 4.

BETTER HIGH-INTENSITY CARBON ARC LAMPS

To prevent too frequent replacement of the negative electrode in a high-intensity carbon arc lamp, the conventional rod-shaped electrode was replaced with a circular disk type. A report by Army Engineer Research Development Laboratories describes a successful adaptation of the circular type electrode to high-intensity arc lamps, the automatic feeding system for the disc electrode, stability of the arc, advantages of the new type arc lamp and possible new applications. PB 106709, Microfilm $1.75, Photostat $2.50. Order from LC. See Instructions, page 4.

EVALUATION OF ACTH IN TREATMENT OF SEVERE BURNS

A recent issue of the U. S. Navy Medical Newsletter discusses the article "An Evaluation of Pituitary Adrenocorticotropic Hormone (ACTH) in the treatment of Severe Burns". PB 100951, Mimeo. $.10. Order from OTS. See Instructions, page 4.

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Gleser, Ann Lawler, and George Winokur. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 42p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107351

EEG response to intermittent photic-stimulation was studied in 221 subjects classified as to anxiety-proneness by psychiatric and psychological screening. Significant correlations exist between anxiety-proneness and (a) flicker-induced subjective dysphoria; (b) upper harmonic EEG response to selected flicker frequencies; (c) shift of driving centroid from normal range; (d) the proportion of abnormal and low alpha resting EEG records. Combining an experimental stress situation with prolonged photic stimulation produced changes in the EEG response but did not select anxiety-prone individuals. Contract no. AF 33(038)-13884. Appendix A: Distribution of subjects as to source and criterion classification. Appendix B: For your information. - Appendix C: Flicker-stress experiment procedure - Appendix D: Neuropsychiatric history. - Appendix E: Check list of anxiety signs in the Rorschach. - Appendix F: Frequency distributions and tests... Appendix G: Comparisons... AAF SAM Proj. 21-37-002, Report no. 4.

RESEARCH AND DEVELOPMENT OF NEW ELECTRONIC TECHNICIAN SELECTION TESTS. FINAL REPORT UNDER CONTRACT NONR 328(00), by A. J. Stauffer and Robert L. Thorndike. Columbia University. Teachers College. Aug 1952. 29p tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107243

As the first phase of the present contract, two new forms of the Electronic Technician Selection Test were prepared. These were built to the same content specifications as Form 10A, the form in operational use at the time, but were made somewhat easier. Approved techniques of item preparation, editing, and analysis were used, and norms were developed for the resulting tests. Issued as Bureau of Naval Personnel. Research report.

Photographic and Optical Goods

SUPPLEMENTARY PROGRESS REPORT ON UNDER WATER PHOTOGRAPHY, by Edward M. Thorndike. May 1942. 7p diagrs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107438

1. Photography, Underwater 2. Filters, Color 3. Meters, Transparency.

OEMsr-31. Listed in Catalog of OSRD reports as no. 8378.

Physics

General

THEORY OF IMPULSE NOISE MEASUREMENTS. PHASE REPORT NO. 1 UNDER CONTRACT AF33-(038)-17144, by B. R. Gelbaum. Lightning and Transients Research Institute, Minneapolis, Minn. Dec 1951. 24p diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107414

By decomposing noise waveforms into component pulses of a particularly simple form the rms of the output of a receiver which has been shock excited by noise is calculated. The random character of the noise enables one to make certain statements concerning the average rms. L & T report no. 194.

Nuclear

NUCLEAR G-FACTOR PLOT, by C. K. Jen. Harvard University. Cruft Laboratory. Mar 1950. 7p diagr Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107267

A scheme was devised to emphasize in a single plot the regularities in the g-factors for all nuclei with nonvanishing magnetic moments and spin angular momentums. Regularities between the g-factors of an odd-odd nucleus and an odd-even nucleus and between the odd-odd and even-odd are prominent when the g-factors are plotted against N-Z (excess of the number of neutrons over the number of protons). Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TM 7.

STUDIES ON RADIOACTIVE BROMINE, by Eric Berne. Chalmers University of Technology, Gothenburg, Sweden. Laboratory for Nuclear Chemistry. 1952. 49p photos, drawings, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107364

1. Radiobromine - Sweden 2. Radioactivity - Measurements - Sweden 3. Ions - Exchange - Sweden 4. Atomic power - Research - Sweden 5. Chalmers University of Technology, Gothenburg, Sweden. Transactions no. 124.

Psychology

EFFECT OF A SIMPLE TRAINING PROCEDURE ON THE JUDGMENT OF VISUAL NUMBER. INVESTIGATIONS CONDUCTED by A. L. Minturn and T. W. Reese, report prepared by E. L. Kaufman. Mount

Holyoke College. Psychophysical Research Unit. Sep 1951. 14p graphs, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111039

1. Visual perception - Training 2. SDC TR 131-1-1. Contract Nonr-131(01), Project NR-784-001. SDC Human Engineering project 20-L-2.

EFFECTS OF PSYCHOLOGICAL STRESS UPON PERCEPTUAL-MOTOR PERFORMANCE, by James Deese and Richard S. Lazarus. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Jun 1952. 20p photo, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107411

1. Psychomotor tests 2. Stresses, Psychological - Effect on performance 3. AAF HRRC RB 52-19. Contract no. AF 33(038)-13253, Project no. 509-020-0003.

RESPONSE MECHANISMS AT THE VISUAL THRESHOLD, A METHODOLOGICAL STUDY. STATUS REPORT I, PERIOD 1 JAN 1951-30 JUN 1952, UNDER CONTRACT N5ORI-07639, PROJECT NR 140-015. Harvard University. Psychological Laboratories. Jul 1952. 10p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107381

1. Visual perception 2. Visual research. PLR-4.

SOME EFFECTS OF VARIOUS DEGREES OF SUPPLEMENTAL INFORMATION GIVEN AT TWO LEVELS OF PRACTICE UPON THE ACQUISITION OF A COMPLEX MOTOR SKILL, by Edward A. Bilodeau. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Apr 1952. 22p graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107346

1. Psychological tests 2. Psychomotor tests 3. Pedestal Standard Manipulation Test 4. AAF HRRC RB 52-15. Project no. 509-020-0007.

SPEED AND ACCURACY OF DISCRIMINATING DIFFERENCES IN HUE, BRILLIANCE, AREA, AND SHAPE, by J. B. Reed. Mount Holyoke College. Psychophysical Research Unit. Sep 1951. 30p photo, diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111040

1. Visual perception - Tests 2. Symbols 3. SDC TR 131-1-2. Contract Nonr-131 (01), Project NR-784-001. SDC Human Engineering Project 20-L-2.

Rubber and Rubber Products

GOVERNMENT DEPARTMENT SPECIFICATION FOR GENERAL STORES: VULCANIZED RUBBER. Gt. Brit. Ministry of Supply. Technical Co-ordinating Committee on General Stores. Jun 1933. 7p drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 107318

1. Rubber - Vulcanization - Gt. Brit. 2. MS TGS 25A. S. O. code no. 57-9999.

RADOME MATERIALS RESEARCH AND FABRICATION DEVELOPMENT SERVICE. FINAL ENGINEERING REPORT, SUPPLEMENT I UNDER CONTRACT W33-038-AC-15228, by E. Duplaga, C. R. Milone, M. Fleishman, H. A. Pace. Goodyear Aircraft Corporation, Akron, Ohio. Feb 1952. 68p photos, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107372

1. Radar - Domes - Materials 2. Coatings, Protective - Erosion resistance 3. Coatings, Rubber - Synthetic 4. Foams, Chemical - Electrical properties GER 4618. Ref. no. GER-1656. See also PB 104463-104471.

SQUEAL OF TIRES ROUNDING CURVES, by Joseph Barnett. Presented at the 31st annual meeting. Jan 1952. Highway Research Board. 1952. 21p photos, diagrs, graphs Available from Highway Research Board, 2101 Constitution Avenue, N. W., Washington, D. C. $.30. PB 107418

1. Tires, Automotive - Noise 2. NRC 223 3. HRB Bul 51. National Research Council. Publication 223.

Structural Engineering

APPLICATION OF LIMIT ANALYSIS TO PUNCH IDENTIFICATION PROBLEMS, by R. T. Shield and D. C. Drucker. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Jul 1952. 30p diagrs Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $2.00, Photostat $3.75. PB 107337

Limit analysis is applied to obtain upper and lower bounds for the punch pressure in the indentation of the plane surface of a perfectly plastic material by a flat rigid punch. The two-dimensional flat punch and the three-dimensional flat square and rectangular punch problems are considered. The analysis assumes Tresca's yield criterion of constant maximum shearing stress, k, during plastic deformation. It is shown that the pressure required to produce identation in the two-dimensional problem lies between 5k and (2+ π)k. The lower bound obtained for any rectangular punch is again 5k while the upper bound for a smooth punch lies between 5.71k for a square and (2+ π)k for a very long rectangle. A

value of 5.36k is found for a ratio of length to breadth of 3. The limit pressure for a uniformly loaded area, as distinguished from an area loaded by a punch, is bracketed by 5k and (2+ π)k when the area is convex. Technical report no. 75. A11-75/30. Contract N7onr-35801, T. O. I, NR-041-032. GDAM TR 75. GDAM A11-75/30.

BUCKLING OF PRETWISTED COLUMNS, by J. Zickel. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Jun 1952. 56p diagrs, drawings, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107336

The general theory of pretwisted beams and columns of thin-walled section is applied to the buckling of doubly symmetric columns which are initially straight but are pretwisted at constant rate. A possible purpose for such a twist is to increase the buckling strength by bringing a variation of moments of inertias of the cross-section into play, instead of letting it be a function of the smallest only. The transverse buckling load for a column with decidedly unequal principal moments of inertia is found to increase up to 50% for total angles of initial twist not exceeding 2 π but it is found to decrease continuously with greater twist. Columns of equal principal moments of inertia exhibit only a weakening effect due to initial twist. It is shown that the buckling load is expressible as the product of a reduced Euler load, as defined in this paper, and a stiffening factor. In addition to transverse buckling, torsional failure of a perfectly elastic column is discussed. With increasing initial twist, there is a marked increase in torsional rigidity. A11-74. Contract N7onr-35801 T. O. I, NR-041-032. Appendix: Mathematical derivation. - Supplement: The equations of equilibrium...GDAM TR 74. GDAM A11-74.

DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS, by Paul Seide. U. S. National Advisory Committee for Aeronautics. Aug 1952. 21p diagr Available from National Advisory Committee for Aeronautics, 1724 "F" St., N.W., Washington 25, D. C. PB 107329

An investigation has been made of the elastic stability of an idealized box beam with longitudinally stiffened covers connected by posts and subjected to end moments and axial loads. Stability criterions which give the axial stiffness of the posts required to achieve desired stress values in the box-beam covers are derived. NACA TN 2760.

FOAMING-IN-PLACE OF ALKYD RESINS FOR SANDWICH RADOMES. FINAL ENGINEERING REPORT UNDER CONTRACT W33-038-AC-15228, by H. A. Pace and E. Duplaga. Goodyear Aircraft Corporation, Akron, Ohio. Dec 1949. 62p photos, drawing, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107373

Includes the phases of research and development pertaining to the alkyd-isocyanate foam. GER 4097. Supplement II.

HEATING OF PANELS BY FLUE PIPES, by D. I. Lawson, T. L. Fox and C. T. Webster. Gt. Brit. Dept. of Scientific and Industrial Research and Gt. Brit. Fire Offices' Committee. 1952. 53p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107313

Report attempts to assess the temperatures attained by vertical wooden panels when placed near to unenclosed, vertical flue pipes and recommendations are made as to the spacings which should be maintained if the risk of fire due to radiated heat is to be avoided. Deals with unenclosed flue pipes. Contents: Appendix I: Equilibrium temperature attained by irradiated panels. - Appendix II: Configuration factor of a finite vertical cylindrical flue pipe with respect to a symmetrically located point on a vertical panel. - Appendix III: Transient heating conditions. - Appendix IV: Cooling of vertical surfaces by radiation and convection. DSIR Fire SR 1.

LIGHTING OF OFFICE BUILDINGS. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Board. Lighting Committee. 1952. 100p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107430

1. Buildings - Lighting - Gt. Brit. 2. Lighting, Industrial - Gt. Brit. 3. DSIR PWBS 30.

P. V. Burnett, Chairman. S. O. code no. 67-11-30.

Transportation Equipment

Aeronautics

Aircraft

AIRCRAFT LANDING GEAR: GROUND LOADS WHEN SPINNING-UP THE WHEELS AT TOUCH-DOWN, by J. W. Blinkhorn. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1948. 13p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107302

The investigation covers all combinations of landing speed, coefficient of friction between the tyre and the ground, and harshness of landing, for any type of pneumatic tyre and wheel unit. Particular attention has been given to landing speeds between 50 and 150 m.p.h.,coefficients of friction from 0 to 2.0, and landings giving vertical wheel accelerations of 1g, 2g, 3g, 4g. Cover date is 1952. S. O. code no. 23-2588. ARC RM 2588.

ANALYSIS OF LANDING-GEAR BEHAVIOR, by Benjamin Milwitzky and Francis E. Cook. U. S. National Advisory Committee for Aeronautics. Aug 1952. 100p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107332

The behavior of the conventional oleo-pneumatic landing gear during impact is analyzed. The appli-

cability of the analysis to actual landing gears is established by comparing calculated results with drop-test data. In addition to the more exact treatment, studies are made to determine the effects of variations in such parameters as the force-deflection characteristics of the tire, the orifice discharge coefficient, and the polytropic exponent for the air-compression process in the shock strut, which may not be known accurately in practical design problems. An investigation is also made to determine the extent to which representation of the system can be simplified and still yield useful results. Generalized solutions for the behavior of a simplified system, which may be useful in preliminary design, are presented for a wide range of landing-gear and impact parameters. Contents: - Appendix A: Numerical integration procedures. - Appendix B: Source of experimental data. NACA TN 2755.

BOUND AND TRAILING VORTICES IN THE LINEARISED THEORY OF SUPERSONIC FLOW, AND THE DOWNWASH IN THE WAKE OF A DELTA WING, by A. Robinson and J. H. Hunter-Tod. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1947. 14p diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107293

The field of flow round a flat aerofoil at incidence can be regarded in linearised theory as the result of both bound and trailing vortices for supersonic as well as for low-speed flight. This leads to a convenient method, given the lift distribution over an aerofoil, for calculating the flow round it at supersonic speeds. As an application of the results the downwash is calculated in the wake of a delta wing lying within the Mach cone emanating from its apex. The downwash is found to be least just aft the trailing edge and is everywhere less than the downflow at the aerofoil. It increases steady to a limiting value which is attained virtually within two chord lengths of the trailing edge. The ratio of the downwash at any point in the wake to the downflow at the aerofoil decreases with increasing Mach number and apex angle. Cover date is 1952. S. O. code no. 23-2409. ARC RM 2409.

CONTROL OF ODORS IN EVACUATION AIRCRAFT, by A. Haldane Gee and Alexander H. Pinkes. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Sep 1951. 69p photos, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107341

This is the second part of the work on an odor control project which has as its ultimate aim the control or elimination of malodors on evacuation aircraft by some suitable agent, preferably for use in aerosol form, without masking such alarm odor signals as the fumes of gasoline, hydraulic fluid, hot oil, scorching paint or burning insulation. A previous report showed that certain essential oils, aldehydes and related odor control agents were at least partly effective in reducing malodors like those of wounds when commingled in vapor form with the malodors. The present report gives the characteristics and behavior of the alarm odors, which are neither suppressed by malodor nor masked by many of the control agents at levels at which the control agents appear to be useful. Quarterly and concluding report under Contract no. AF 33(038)-18819. For part 1 see PB 106830. AAF TR 6565, Part 2.

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEPTBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6, by Byron M. Jaquet. U. S. National Advisory Committee for Aeronautics. Aug 1952. 27p diagrs, graph Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107386

An investigation was made in the Langley stability tunnel at low scale to determine low-speed effects of linear spanwise variations of twist and circular-arc camber on static-stability and rotary-stability (rolling and yawing) derivatives of a 45° sweptback wing of aspect ratio 4 and taper ratio 0.6. NACA TN 2775.

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN 0.97 X 10^6 AND 8.10 X 10^6 ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS, by James E. Fitzpatrick and William C. Schneider. U. S. National Advisory Committee for Aeronautics. Aug 1952. 34p photos, drawings, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107331

The effects of Mach number and Reynolds number on the maximum lift coefficient of a wing of NACA 64-210 airfoil sections are presented. The wing was tested with and without partial-span and full-span split flaps deflected 60°. Peak maximum lift coefficients were measured at Mach numbers between 0.12 and 0.20, depending on the Reynolds number range and flap configuration. NACA TN 2753.

EXPERIMENTS ON DISTRIBUTED SUCTION THROUGH A ROUGH POROUS SURFACE, BY THE CAMBRIDGE UNIVERSITY AERONAUTICAL LABORATORY. COMMUNICATED BY P.D.S.R. (A), MINISTRY OF SUPPLY. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1951. 7p table, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107291

Flight tests in which suction was applied through a slightly rough porous surface to maintain laminar flow in the boundary layer have shown that when the pressure on the surface was uniform there was an upper limit to the airspeed outside the layer above which no reasonable suction would prevent transition to turbulence. Comparison between these and similar tests on a smoother surface suggest that there will be, associated with every porous surface, two limiting speeds, one above which no reasonable suction will maintain laminar flow and one below which the surface can be regarded as aerodynamically smooth. Consideration is given to the way in which these speeds will vary with the kinematic viscosity of the air, in conditions which lead to dynamical similarity. C.P. no. 84. Cover date is 1952. S. O. Code no. 23-9006-84. ARC CP 84.

EXPERIMENTS ON THIN TURNING VANES, by C. Salter. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1946. 29p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 107297

The experiments recorded in this paper refer to a variety of tests made on corner vanes (mainly thin curved plates) in a tunnel one foot square, with the object of indicating whether and to what extent they would be suitable for deflecting the air stream around the corners of return-flow type wind tunnels. Cover date is 1952. S.O. code no. 23-2469. ARC RM 2469.

GROUND EFFECT ON DOWNWASH WITH SLIPSTREAM, by P. R. Owen and H. Hogg. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1944. 12p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107295

It is shown in this report that given the downwash at the tailplane with slipstream, then the decrement in downwash at the same incidence and propeller thrust coefficient due to ground interference can be estimated by the formula of Piper and Davies (with certain slight modifications) with sufficient accuracy for most practical purposes. Appendix: Derivation of formula. Cover date is 1952. S. O. code no. 23-2449. ARC RM 2449.

HULL LAUNCHING TANK (DESCRIPTIVE), by A. G. Smith, G. C. Abel and W. Morris. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1943. 22p photos, drawings, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 107308

The hull launching tank has been built in order that systematic measurements of impact pressures can be made on large model seaplane hulls to supplement full scale tests, and to cover conditions of impact which would be dangerous full scale. The object is to obtain generalised formulae for the maximum local pressures, the total impact load and the simultaneous distribution of pressure on any hull form for any impact condition. The report describes the hull launching tank and apparatus, the range of impact conditions possible for test, and the methods developed for measuring the parameters which affect the impact loads. Theoretical considerations, the results of tests and further developments, will be found in existing or in subsequent reports. Contents: Appendix I: Accuracy of measurement required. Cover date is 1952. S. O. code no. 23-2723. ARC RM 2723.

PRODUCTION OF LIFT INDEPENDENTLY OF INCIDENCE: THE THWAITES FLAP, PARTS I AND II, by B. Thwaites. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1947. 20p drawings, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107304

In Part I of this paper, the possibility of obtaining lift on a body in a uniform stream independently of the incidence is discussed, and a practical method which obtains this effect is given. In Part II of the paper, a report is given of a preliminary experiment which was set up to investigate whether the theoretical predictions made about the efficacy of the flap were largely confirmed. Cover date is 1952. S. O. code no. 23-2611. Contents: Part I: Introduction. - Part II: Method. ARC RM 2611.

SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS, by Franklin W. Diederich. U. S. National Advisory Committee for Aeronautics. Aug 1952. 63p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107325

Several approximate methods for calculating lift distributions at subsonic speeds are combined and extended to form a simple step-by-step procedure for calculating symmetric and antisymmetric lift distributions on swept and unswept wings. The extension of the method to the calculation of aerodynamic influence coefficients and of spanwise moment distributions is indicated. NACA TN 2751.

SPEEDS AND NORMAL ACCELERATIONS OF BOEING "CLIPPER" AIRCRAFT ON NORTH AND SOUTH ATLANTIC ROUTES, by D. T. Jones. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1948. 14p diagrs, map, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107305

1. Airplanes, Transport - Routes - Gt. Brit. 2. Airplanes, Transport - Speed - Gt. Brit. 3. British Overseas Airways Corporation 4. Clipper (Airplane) 5. Boeing Clipper (Airplane) 6. ARC RM 2633.

Cover date is 1952. S. O. code no. 23-2633.

SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW, by Arthur L. Jones and Alberta Alksne. U. S. National Advisory Committee for Aeronautics. 1951. 37p diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.30. PB 107277

Values of the lateral-stability derivatives for wings at supersonic speeds, calculated using the linearized theory for compressible flow, are presented in the form of design charts showing the variations of the derivatives with Mach number and aspect ratio for six plan forms. Limitations in the applicability and availability of the lateral-stability derivatives are discussed. NACA Rept. 1052.

TESTS ON THREE EQUILATERAL TRIANGULAR PLATES IN THE COMPRESSED AIR TUNNEL, by R. Jones and C. J. W. Miles. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1946. 7p graphs, tables Available from British Informa-

tion Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107298

The report gives C_L, C_D and C_m on three equilateral triangular plates with sides 26, 36 and 47.8 in. The object of the tests was to estimate the size of sweptback wings of that form, which can be tested in the Compressed Air Tunnel without the application of excessive tunnel corrections. After applying the usual tunnel corrections and making small corrections due to dissymmetry in the models, it was found that C_L on the three models agreed if the results on the 36 in. and 47.8 in. models were multiplied by 1.01 and 1.05 respectively. Fair agreement was obtained on C_D for the three models. The mean position of the centre of pressure is about 0.45 of the height of the triangle forward of the trailing edge. Cover date is 1952. S. O. code no. 23-2518. ARC RM 2518.

YAWING VIBRATIONS OF AN AIRCRAFT, by J. Morris and G. S. Green. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1946. 11p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107300

This report gives a theoretical method for calculating the natural frequencies and modes of yawing vibration of a complete aircraft. The basic feature of the treatment is the replacement of the continuous mass system by one consisting of a finite number of discrete masses elastically interconnected. In the course of the analysis, use is made of the deflection coefficient artifice in the formation of the equations of motion, and the escalator process in their marshalling and numerical solution. The method has been applied to a single-engined fighter aircraft, for which the results of a resonance test were available. These results appear to be some 40 per cent. in excess of their calculated counterparts and no satisfactory explanation occurs to the authors to account for this incompatibility. Cover date is 1952. S. O. code no. 23-2525. ARC RM 2525.

Instruments

EFFECTS OF PURE RED AND LOW-COLOR-TEMPERATURE WHITE INSTRUMENT LIGHTING UPON DARK-ADAPTED VISUAL THRESHOLDS, by Kenneth T. Brown and Walter F. Grether. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Apr 1952. 23p photo, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107340

1. Airplanes - Instrument panels - Illumination 2. Vision - Dark adaptation - Effect of red illumination 3. Vision - Dark adaptation - Effect of white illumination 4. Vision - Dark adaptation - Tests 5. AAF TR 6470.

INSTRUMENT-FLIGHT RESULTS OBTAINED WITH A COMBINED-SIGNAL FLIGHT INDICATOR MODIFIED FOR HELICOPTER USE, by Almer D. Crim, John P. Reeder and James B. Whitten. U. S. National Advisory Committee for Aeronautics. Aug 1952. 13p photos, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107330

A flight indicator which combines heading, altitude, bank-angle, and pitch-attitude information was modified for helicopter use and evaluated by means of instrument flights in a single-rotor helicopter. The modifications consisted of adding fuselage-rate-of-pitch signals to the instrument and increasing the ratio between heading and bank signals. The combined signal flight indicator enables the pilot to maintain more precise control of heading, altitude, and airspeed and required less concentration than with conventional instruments. NACA TN 2761.

Engines and Propellers

DRIVING STANDING WAVES BY HEAT ADDITION, by Perry L. Blackshear, Jr. U. S. National Advisory Committee for Aeronautics. Aug 1952. 46p photos, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107385

Types of burner instability are enumerated and the role of standing waves in burners is discussed. The status of the problem of flame-driven standing waves is reviewed and a one-dimensional flow theory giving the mechanism whereby a flame drives or damps a standing wave is presented. In this theory, the reflection, transmission, and amplification of waves passing through a flame region were determined from the continuity and momentum equations. For the model considered, waves were found to pass through the flame front with their velocity amplitudes unaltered so long as the flame area remained unchanged. A change in flame area acted as a source of waves propagating simultaneously into the hot and cold gases on either side of the flame zone. The one dimensional theory seems an adequate explanation of the experimental observations. NACA TN 2772.

DYNAMICS OF MECHANICAL FEEDBACK-TYPE HYDRAULIC SERVOMOTORS UNDER INERTIA LOADS, by Harold Gold, Edward W. Otto and Victor L. Ransom. U. S. National Advisory Committee for Aeronautics. Aug 1952. 63p photos, drawings, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107333

An analysis of the dynamics of mechanical feedback-type hydraulic servomotors under inertia loads is developed and experimental verification is presented. This analysis, which is developed in terms of two physical parameters, yields direct expressions for the following dynamic responses: (1) the transient response to a step input and the maximum cylinder pressure during the transient and (2) the variation of amplitude attenuation and phase shift with the frequency of a sinusoidally varying input. Close agreement was obtained between analytically determined responses and measured responses. Contents: - Appendix A: Apparatus and experimental procedures. - Appendix B: Derivation of equations for transient response in which upstream cylinder pressure is limited at absolute zero. NACA TN 2767.

EFFECT OF A SIMULATED PROPELLER SLIPSTREAM ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING PANEL WITH AND WITHOUT NACELLES AT MACH NUMBERS FROM 0.30 TO 0.86, by Gareth H. Jordan and Richard I. Cole. U. S. National Advisory Committee for Aeronautics. Sep 1952. 15p photo, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107435

Results of an investigation are presented to show the effect of a simulated propeller slipstream on the lift, drag, and pitching-moment characteristics of an unswept wing panel with and without nacelles. The data were obtained in the Langley 24-inch high-speed tunnel through a range of Mach numbers from approximately 0.30 to 0.86 for angles of attack of 0^{o} and 3^{o}. NACA TN 2776.

EFFECTS OF ATMOSPHERIC HUMIDITY AND TEMPERATURE ON THE ENGINE POWER AND TAKE-OFF PERFORMANCE OF A HASTINGS I, by G. Jackson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1950. 35p maps, graphs (1 fold), tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 107290

Experiments establish that engine power decreases with increasing humidity and that the reduction is greatest at take-off engine speed and boost. Independent meteorological information suggests that the specific humidity will rarely exceed 2 1/2%. The investigation has shown that this degree of humidity causes a reduction in take-off power of approximately 10% compared with operation in completely dry air at the same temperature. Two thirds of this reduction are accounted for by the displacement of dry air and the effective richening of the mixture; the remainder is attributed to the effect of humidity on the combustion process. Contents: Appendix I: Variation of take-off distance with power and air density. - Appendix II: Calculation of component effects of humidity on engine power. - Appendix III: Notes on the distribution and variation of atmospheric humidity. C. P. no. 77. Report no. A.A.E.E./Res/248. Cover date is 1952. S. O. code no. 23-9006-77. ARC CP 77.

EXPERIMENTAL STUDIES OF NOISE FROM SUBSONIC JETS IN STILL AIR, by Leslie W. Lassiter and Harvey H. Hubbard. U. S. National Advisory Committee for Aeronautics. Aug 1952. 35p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107328

Experimental studies have been made of the noise from a series of model subsonic jets ranging in diameter from 0.75 to 12.0 inches and the results are compared with data obtained for a turbojet engine. The effects of such parameters as jet size, exit gas velocity, density, and turbulence level on the noise generated in the mixing region of a jet are evaluated. The velocity and turbulence level were found to have the greatest effect on the noise intensities and the frequency content was found to be a function of jet size and the observer's location. The noise generated by the turbojet engine was found to be closely related to that generated by simple model jets and an empirical relation is given to allow the extrapolation of available jet-noise data to other operating conditions. NACA TN 2757.

NOISE FROM INTERMITTENT JET ENGINES AND STEADY-FLOW JET ENGINES WITH ROUGH BURNING, by Leslie W. Lassiter. U. S. National Advisory Committee for Aeronautics. Aug 1952. 21p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107326

Sound measurements were made on a pulse jet and a subsonic ram jet of the types used for helicopter rotor propulsion and on a turbojet with afterburner. The pulse jet was found to produce a discrete frequency spectrum in which the component corresponding to the engine firing frequency was generally predominant. An analysis of pulse jet noise, based on resonant-tube theory, is presented. The analysis allows a reasonable estimate of the noise level, if certain of the flow parameters of the engine are known. The small subsonic ram jet and the turbojet afterburner unit were found to produce discrete frequency spectrums somewhat similar to that of the pulse jet. NACA TN 2756.

NOTE ON THE CHARACTERISTIC CURVE FOR AN AIRSCREW OR HELICOPTER, by C.N.H. Lock. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1947. 3p graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107306

1. Propellers - Design - Gt. Brit. 2. Helicopters - Design - Gt. Brit. 3. Vortex motion - Theory - Gt. Brit. 4. ARC RM 2673.

Cover date is 1952. S. O. code no. 23-2673.

Aerodynamics

ACCURACY OF APPROXIMATE METHODS FOR PREDICTING PRESSURES ON POINTED NONLIFTING BODIES OF REVOLUTION IN SUPERSONIC FLOW, by Dorris M. Ehret. U. S. National Advisory Committee for Aeronautics. Aug 1952. 26p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107324

The accuracy and range of applicability of the linearized theory, second-order theory, tangent-cone method, conical-shock-expansion theory, and Newtonian theory for predicting pressure distributions on pointed bodies of revolution at zero angle of attack are investigated. Various body shapes are included in the investigation and a wide range of supersonic Mach numbers and fineness ratios is included. It is found that, for most combinations of Mach number and fineness ratio, one of the approximate methods will give pressure drag within 10 percent. NACA TN 2764.

AERODYNAMIC DERIVATIVES WITH RESPECT TO SIDESLIP FOR A DELTA WING WITH SMALL DI-

HEDRAL AT ZERO INCIDENCE AT SUPERSONIC SPEEDS, by A. Robinson and J. H. Hunter-Tod. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1947. 14p diagrs, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107294

Expressions are derived for the sideslip derivatives on the assumptions of the linearised theory of flow for a delta wing with small dihedral flying at supersonic speeds. A discussion is included in the Appendix on the relation between two methods that have been evolved for the treatment of aerodynamic force problems of the delta wing lying within its apex Mach cone. When the leading edges are within the Mach cone from the apex, the pressure distribution and the rolling moment are independent of Mach number but dependent on aspect ratio. When the leading edges are outside the apex Mach cone, the non-dimensional rolling derivative is, in contrast to the other case, dependent on Mach number and independent of aspect ratio; the other derivatives and the pressure, however, are dependent on both variables. Appendix: Relation between two methods of treating aerodynamic force problems of a delta wing at supersonic speeds. Cover date is 1952. S. O. code no. 23-2410. ARC RM 2410.

ANALYSIS OF FLOW IN A SUBSONIC MIXED-FLOW IMPELLER, by Chung-Hua Wu, Curtis A. Brown and Eleanor L. Costilow. U. S. National Advisory Committee for Aeronautics. Aug 1952. 45p drawing, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107384

A method recently developed for determining the steady flow of a nonviscous compressible fluid along a relative stream surface extending from hub to casing between two adjacent blades in a turbomachine is applied to investigate the through flow of air in an experimental mixed-flow impeller of high solidity. The shape of the stream surface is taken to be the same as that of the mean camber surface of the blade which consists of all radial elements. The principal equation governing the through flow is solved by the relaxation method with the use of fourth-degree differentiation formulas for unequally spaced grid points caused by the varying hub and casing wall radii. A detailed analysis is made of both incompressible and compressible flow through the impeller, and contour plots of the stream function, velocity components, total enthalpy, static pressure, and Mach number are presented and discussed. NACA TN 2749.

CALCULATED AERODYNAMIC CHARACTERISTICS OF TWO INDEFINITE WINGS WITH CONSTANT CHORD, by V. M. Falkner. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1947. 10p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107303

The report gives solutions obtained by the vortex lattice method for the aerodynamic loading of two infinite wings of constant chord with sweepback of 45 deg, one with a V-joint at the centre, the other rounded off with arcs of radius four times the chord. The results will be used to modify loading functions used in vortex lattice theory in order to improve solutions for wings of small aspect ratio, particularly when the leading or trailing edges meet at an included angle which differs considerably from 180 deg. Cover date is 1952. S. O. code no. 23-2594. ARC RM 2594.

COMPARISON OF THEORETICAL AND EXPERIMENTAL HEAT-TRANSFER CHARACTERISTICS OF BODIES OF REVOLUTION AT SUPERSONIC SPEEDS, by Richard Scherrer. U. S. National Advisory Committee for Aeronautics. 1951. 17p photo, drawings, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 107323

An investigation of the three important factors that determine convective heat-transfer characteristics at supersonic speeds, location of boundary-layer transition, recovery factor, and heat-transfer parameter has been performed at Mach numbers from 1.49 to 2.18. The bodies of revolution that were tested had, in most cases, laminar boundary layers, and the test results have been compared with available theory. Boundary-layer transition was found to be affected by heat transfer. Adding heat to a laminar boundary layer caused transition to move forward on the test body, while removing heat caused transition to move rearward. These experimental results and the implications of boundary-layer-stability theory are in qualitative agreement. Theoretical and experimental values of the recovery factor, based on the local Mach number just outside the boundary layer, were found to be in good agreement for both laminar and turbulent boundary layers on both of the body shapes that were investigated. In general, values of the heat-transfer parameter (Nusselt number divided by the square root of the Reynolds number) as determined for both heated and cooled cones with uniform and nonuniform surface temperatures, were in good agreement with theory. It was also found that the theory for cones could be used to predict the values of heat-transfer parameter for a pointed body of revolution with large negative pressure gradients with good accuracy. Supersedes NACA TN 1975 (PB 99087), NACA TN 2087 (PB 110044), NACA TN 2131 (PB 101156), NACA TN 2148 (PB 101373), and NACA RM A8L28. NACA Rept. 1055.

DIFFUSION OF TRANSVERSE LOADS IN A REINFORCED CIRCULAR CYLINDER WITH NON-RIGID FRAMES, by S. B. Lewis. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1950. 24p diagrs, graphs (2 fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107289

This report explores the variation of shear stress distribution at a loaded frame in a reinforced circular cylinder, consequent upon the variation of several geometrical parameters such as frame stiffness, skin thickness, stringer spacing, etc. The parameters chosen are those common to aircraft design, and it is possible to obtain a reasonably accurate shear distribution around a frame from the data supplied, without doing the actual lengthy shear

calculation. Indication is also given as to when the beam theory distribution of shear can be used with a reasonable degree of accuracy. The Appendix gives the method of obtaining the shear load due to a tangential load and moment from the radial load expressions. Contents: Appendix A: Derivation of the shear load due to tangential load and moment from the radial load expression. C. P. 74. Report no. 33. Cover date is 1952. S. O. code no. 23-9006-74. ARC CP 74.

FORCED FLOW AGAINST A ROTATING DISC, by D. M. Hannah. Communicated by W. G. Bickley. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1947. 17p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107309

The present paper deals with the general question of steady irrotational flow with axial symmetry against an infinite rotating lamina. Cover date is 1952. S. O. code no. 23-2772. ARC RM 2772.

GUST-RESPONSE ANALYSIS OF AN AIRPLANE INCLUDING WING BENDING FLEXIBILITY, by John C. Houbolt and Eldon E. Kordes. U. S. National Advisory Committee for Aeronautics. Aug 1952. 48p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107433

An analysis is made of the gust response (including bending moment) of an airplane having the degrees of freedom of vertical motion and wing bending flexibility and basic parameters are established. A convenient numerical solution of the response equations, well-suited for trend studies, is developed and used in an example. A method is indicated for determining the gust causing a known response and a procedure is given for determining the response of an airplane directly from the known response of another airplane. NACA TN 2763.

LIMITATIONS OF USE OF BUSEMANN'S SECOND-ORDER SUPERSONIC AEROFOIL THEORY, by W. F. Hilton. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1952. 9p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107299

1. Busemann second-order-approximation theory 2. Airfoil theory 3. Flow, Supersonic - Theory 4. ARC RM 2524.

Cover date is 1952. S. O. code no. 23-2524.

NOTE ON SEMI-EXPERIMENTAL METHODS FOR THE DETERMINATION OF AERODYNAMIC DERIVATIVES FOR AN OSCILLATING WING-AILERON SYSTEM, by P. F. Jordan. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1948. 6p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107307

A brief survey is given of existing semi-experimental methods for the determination of two-dimensional aerodynamic derivatives for unsteady motion of a wing-aileron system (and, in particular, for aerodynamically balanced controls); a comparison with (partly unpublished) experimental data is made. The result is encouraging for further investigations. Cover date is 1952. S. O. code no. 23-2706. ARC RM 2706.

ON THE MOMENTUM EQUATION IN LAMINAR BOUNDARY-LAYER FLOW. A NEW METHOD OF UNIPARAMETRIC CALCULATION, by B. Thwaites. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1947. 9p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107301

In this paper, a new method is described of combining velocity distributions in the form $y/\theta = F(u/U) + \lambda\ G(u/U)$, and it is shown that such a combination avoids several difficulties. This method of combination also allows a second parameter apart from λ, which might be found valuable in certain problems. Cover date is 1952. S. O. code no. 23-2587. ARC RM 2587.

PRACTICAL CALCULATION OF SECOND-ORDER SUPERSONIC FLOW PAST NONLIFTING BODIES OF REVOLUTION, by Milton D. Van Dyke. U. S. National Advisory Committee for Aeronautics. Jul 1952. 65p diagrs, graphs, tables (2 fold) Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107220

Calculation of second-order supersonic flow past bodies of revolution at zero angle of attack is described in detail, and reduced to routine computation. Use of an approximate tangency condition is shown to increase the accuracy for bodies with corners. Tables of basic functions and standard computing forms are presented. The procedure is summarized so that one can apply it without necessarily understanding the details of the theory. A sample calculation is given, and several examples are compared with solutions calculated by the method of characteristics. NACA TN 2744.

PUBLISHED REPORTS AND MEMORANDA OF THE AERONAUTICAL RESEARCH COUNCIL. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1951. 5p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107292

1. Aerodynamics - Bibliography - Gt. Brit. 2. Aeronautical research - Bibliography - Gt. Brit. 3. ARC RM 2350.

Cover date is 1952. S. O. code no. 23-2350.

SOME EFFECTS OF AMPLITUDE AND FREQUENCY ON THE AERODYNAMIC DAMPING OF A MODEL OSCILLATING CONTINUOUSLY IN YAW, by Lewis R. Fisher and Walter D. Wolhart. U. S. National Advisory Committee for Aeronautics. Sep 1952. 24p

photo, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107434

A fuselage——vertical-tail combination was oscillated in yaw through a range of amplitudes from $1/2^{o}$ to 4^{o} and a low range of the reduced-frequency parameter. The phase angles between the tail force and the displacement were measured and converted to values of the damping in yaw which are compared with the damping predicted by the unsteady-lift theories and with the experimental steady-state damping value. These tests were conducted at a Reynolds number of 442,000. NACA TN 2766.

STUDY OF THE STABILITY OF THE LAMINAR BOUNDARY LAYER AS AFFECTED BY CHANGES IN THE BOUNDARY-LAYER THICKNESS IN REGIONS OF PRESSURE GRADIENT AND FLOW THROUGH THE SURFACE, by Neal Tetervin and David A. Levine. U. S. National Advisory Committee for Aeronautics. Aug 1952. 83p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107327

Calculations made by the Schlichting method for the computation of laminar-boundary-layer velocity profiles and the Lin method for the computation of their critical Reynolds numbers demonstrate that in a region of falling pressure on an impervious surface an increase in boundary-layer thickness can cause the velocity profile shape to be changed enough by the increase in effective pressure gradient so that the ratio of the local critical Reynolds number to the local boundary-layer Reynolds number is increased. Similar effects occur when there is flow through the surface; in this case the effects depend on the effective flow through the surface as well as on the effective pressure gradient. These calculations suggest that the disturbing effect of roughness particles can be decreased by a sufficient increase in boundary-layer thickness without a decrease in stability. Contents: Appendix A: Modification of the Schlichting method. - Appendix B: Flow at the stagnation point for large blowing quantities. - Appendix C: Von Karman momentum equation for stagnation-point flow. NACA TN 2752.

SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS, by Ralph J. Eschborn. U. S. National Advisory Committee for Aeronautics. Aug 1952. 41p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107334

Axially symmetric supersonic steady flow with vorticity and rotation about the axis is treated by the method of characteristics. Several cases are calculated for flow in annular channels. NACA TN 2768.

USE OF NEGATIVE CAMBER IN THE TRANSONIC RANGE, by W. F. Hilton. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1947. 5p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107296

Certain difficulties are experienced when attempting free flight in the transonic speed range (0.8 to 1.2 of the speed of sound). These difficulties fall into two main classes: namely, (1) overcoming the somewhat high air resistance by means of improvements in engine design: and (2) balancing the aircraft for stable horizontal flight. The latter problem is considered in this paper. Changes of trim arc caused by sudden loss of wing lift in the transonic range, which decreases the downwash over the tail, and possibly results in an uncontrollable nose-heavy dive. The use of negative wing camber for minimizing these effects is suggested, and the suggestion is found to be supported by wind-tunnel experiments. Cover date is 1952. S. O. code no. 23-2460. ARC RM 2460.

Marine Transportation

L'APPLICATION DE LA TURBINE A GAZ A LA PROPULSION DES NAVIRES (APPLICATION OF THE GAS TURBINE TO THE PROPULSION OF SHIPS), BY MR. GAUTIER. TRANSLATED by L. C. Stevens. Jun 1952. 56p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107390

1. Turbines, Gas - France 2. Ships - Propulsion - France 3. NAVSHIPS T481 4. STS 141.

Translated from Nouvautes techniques maritimes, no. 15, 1951, p. 79-93.

DEVELOPPEMENT DE LA TURBINE A GAZ ET L'APPLICATION A LA MARINE (DEVELOPMENT OF THE GAS TURBINE AND ITS NAVAL AND MARINE APPLICATION), BY C. MARTINOT-LAGARDE. TRANSLATED by L. C. Stevens. Jun 1952. 26p photos, diagrs, graphs Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107391

1. Turbines, Gas - France 2. Turbines, Marine - France 3. NAVSHIPS T 482 4. STS 142.

Translated from Nouvautes techniques maritimes no. 15, 1951, p. 71-77.

GETRACHT ZAL WORDEN DE "ERIE" UIT MACOLA BAAI TE VERWIJDEREN (ATTEMPT TO REMOVE THE "ERIE" FROM MACOLA BAY). May 1952. 5p Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107387

1. Erie (Ship) 2. Ships - Salvage - Dutch West Indies 3. NAVSHIPS T477 4. STS 135.

Translation by Bart Landheer of article from a Dutch West Indies newspaper.

Micellaneous

ENTSALZUNG DES MEERWASSERS (DESALTING OF SEA WATER), BY HEINRICH JANTSCH. TRANSLATED AND EDITED by F. A. Raven. Jun 1952. 55p diagrs, table Available from Library of Congress, Photoduplication Section, Washington 25, D.C. Microfilm $2.75, Photostat $7.50. PB 107392

1. Sea water - Desalination - Germany 2. NAVSHIPS T 483 3. STS 143.

Patents

Chemical and Allied Products

GERMAN PATENTS: CLASS 12K, GROUPS 1, 2, 3, 4, 10 AND 11. AMMONIA AND ITS COMPOUNDS, CYANOGEN AND ITS COMPOUNDS. Reichspatentamt, Berlin. 1883-1940. 1143f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $150.00. PB 82389

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 457 patents in Class 12k, groups 1, 2, 3, 4, 10, and 11: Ammonia and its compounds, cyanogen and its compounds. Separation of ammonia from liquids, separation of ammonia from gases and vapors, synthesis of ammonia, preparation of ammonia from molasses waste, and extraction of cyanogen compounds are included. FIAT Microfilm Reel BB 77, Frames 3061-4203.

GERMAN PATENTS, CLASS 12K, GROUP 6; CLASS 12 I, GROUPS 35, 38, AND 40: AMMONIA AND CARBON AND THEIR COMPOUNDS. Reichspatentamt, Berlin. 1877-1942. 776f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $102.50. PB 82422

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 302 patents in Class 12k, group 6, and Class 12 1, groups 35, 38, and 40: Ammonia and carbon and their compounds. Ammonia salts, boron and boron compounds, carbonic-acid compounds, and titanium compounds are included. FIAT Microfilm Reel CC 96, Frames 162-937.

GERMAN PATENTS, CLASS 12M, GROUP 1; CLASS 12 L, GROUPS 1, 8, 9, 10, 11, 14, 15, AND 16: ALKALI OXIDES, HYDROXIDES, AND CARBONATES, AND COMPOUNDS OF THE ALKALINE EARTH METALS. Reichspatentamt, Berlin. 1881-1943. 962f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $126.25. PB 82419

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 375 patents in Class 12 l, groups 1, 8, 9, 10, 11, 14, 15, and 16, and Class 12m, group 1: Alkali oxides, hydroxides, and carbonates, and compounds of the alkaline earth metals. Condensation of salt solution, preparation of alkali hydroxides and alkali carbonates, preparation of alkali carbonates (Solvay process), compounds of alkaline earth metals, and compounds of rare alkali metals, e. g., caesium, lithium, rubidium are included. FIAT Microfilm Reel CC 97, Frames 938-1909. (10 Frames are missing).

GERMAN PATENTS, CLASS 12M, GROUPS 4 AND 5; CLASS 12 L, GROUPS 6 AND 7: COMPOUNDS OF ALKALI EARTH METALS, ALKALI SALTS. Reichspatentamt, Berlin. 1900-1938. 469f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $61.25. PB 82410

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 184 patents in Class 12m, groups 4 and 5, and Class 12 1, groups 6 and 7: Compounds of alkali earth metals, alkali salts. Aluminates, beryllium compounds, alkali nitrates, and preparation of alkali oxides are included. The patents are dated between 1900 and 1938. FIAT Microfilm Reel CC 99, Frames 2886-3354.

GERMAN PATENTS, CLASS 12O, GROUPS 16 AND 17: CARBON ACIDS AND DERIVATIVES. Reichspatentamt, Berlin. 1890-1941. 989f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $1[illegible] PB 82388

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 468 patents in Class 12o, groups 16, 17: Carbon acids and derivatives. Carbon acid amides, and urethane and urea are included. FIAT Microfilm Reel AA 97, Frames 4244-5232.

GERMAN PATENTS, CLASS 12O, GROUPS 22 AND 23: COMPOUNDS WITH UNSATURATED ATOM CHAINS AND ORGANIC COMPOUNDS. Reichspatentamt, Berlin. 1884-1940. 658f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $86.25. PB 82411

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 303 patents in Class 12o, groups 22 and 23: Compounds with unsaturated atom chains and organic compounds. Benzylidene compounds and organic sulfur compounds are included. FIAT Microfilm Reel CC 103, Frames 6410-7067.

GERMAN PATENTS, CLASS 12O, GROUP 23: GENERAL PROCESSES OF ORGANIC CHEMISTRY WITH REGARD TO ORGANIC SULFUR COMPOUNDS.

Reichspatentamt, Berlin. 1887-1941. 1039f Available from Library of Congress, Photoduplication Section, Washington 25, D. C. Microfilm $9.00, Enlargement Print $137.50. PB 82414

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Ge rmany, contains 468 patents in Class 12o, group 23: General processes of organic chemistry with regard to organic sulfur compounds. FIAT Microfilm Reel CC 104, Frames 7068-8106.

GERMAN PATENTS, CLASS 12O, GROUP 25: ORGANIC COMPOUNDS, GENERAL PROCESSES OF ORGANIC CHEMISTRY. Reichspatentamt, Berlin. 1893-1939. 1005f Microfilm $9.00, Enlargement Print $133.75. PB 82413

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 456 patents in Class 12o, group 25: Organic compounds, general processes of organic chemistry. Hydrate cyclic compounds are included. FIAT Microfilm Reel CC 106, Frames 9115-10119.

GERMAN PATENTS, CLASS 12Q, GROUPS 30, 31 AND 32: PHENOLS, NAPHTHOLS, AND THEIR COMPOUNDS. Reichspatentamt, Berlin. 1884-1942. 1003f Microfilm $9.00, Enlargement Print $133.75. PB 82409

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 465 patents in Class 12Q, groups 30, 31, and 32: Phenols, naphthols and their compounds. Naphthol carboxylic acids, phenols and naphthol carbon acid esters, and amino phenols are included. FIAT Microfilm Reel CC 107, Frames 1-1003.

GERMAN PATENTS, CLASS 12Q, GROUPS 32, 33, 34, 35, 36, AND 37: AMINO COMPOUNDS, AMINO NAPHTHOLS, ANTHRAQUINONE, AND THE LIKE. Reichspatentamt, Berlin. 1887-1939. 1050f Microfilm $9.00, Enlargement Print $141.25. PB 82406

This microfilm reel, prepared from the files of the German Patent Office by FIAT personnel in Germany, contains 507 patents in Class 12q, groups 32, 33, 34, 35, 36, and 37: Amino compounds, amino-naphthols, anthraquinone, and the like. Aminophenols, sulfones and carbon acids, mono-amino naphthol sulfonic acids, di- and polyamino oxynaphthalines, and aminoanthracene compounds and derivatives are included. FIAT Microfilm Reel CC 108, Frames 1004-2053.

Medical Research and Practice

A COLLECTION OF DOCTORS' THESES. Freiburg, Germany, University. 1941-1942. 831f Microfilm $9.00, Enlargement Print $106.25. PB 84188

The theses reproduced on this FIAT microfilm reel and listed below will be available as enlargement prints. Please include PB and frame numbers when ordering individual items from this reel.

Frames	Title	Price
2110-2126	Observations on pseudarthroses resulting from operations of fractures by means of Lame's plate. By Armgard Helga Elerman. 1942	$3.25
2127-2206	Genital tuberculosis of women as observed in the Dept. of Gynecology, Freiburg University. By Otto Mehler. 1942.	$11.25
2207-2259	Alemannic skulls from graves arranged in rows and situated at Mengen, Baden (excavation section 1932-1936). By Theodor Meng. 1941.	$8.75
2260-2314	The problem of the hydrogen ion concentration of the sweat of people suffering from skin diseases. By Georg Rühs. 1924.	$8.75
2315-2349	Studies on the Na/Cl quotient of urine with different forms of diet. By Heinz Lothar Wittkowsky. 1942.	$6.25
2350-2413	The effect of various kinds of thymus extracts on the isolated frog-heart. By Hans Joachim Coester. 1942.	$10.00
2414-2435	Relations of the blood pressure to the endocrinous system. By W. Feindt. n.d.	$5.00
2436-2509	Gravidity and ovarial metastases of the malignant melanoma. By Helmut Hoyer. 1942.	$11.25
2510-2549	Experimental and biometric investigations concerning the boiling test of serum according to Kürten. By Charlotte Marquardt. 1942.	$6.25
2550-2576	Studies on the frequency of goitre among the youth of Freiburg (Breisgau). By Rolf Schmidt. 1941.	$5.00
2577-2621	Psychotic content (of delusions) and contemporaneous events. By Gustav Adolf v. Harnak. 1942.	$7.50
2622-2652	10 years of treatment of empyemata at the pediatric ward of Freiburg University. By Anneliese Janzen. 1942.	$6.25
2653-2710	Rare cases of condensations in the spongiosa (A new case of osteopoikilosis). By Herbert Kienle. n.d.	$8.75
2711-2753	Indications for surgical intervention of cholecystitis. By Rudolf Kreibohm. n.d.	$7.50
2754-2788	Skin plastic of the lateral ligaments of the knee joint. By Karl Heinz Pfister. 1942.	$6.25

Frames	Title	Price
2789-2865	The problem of the so-called essential xanthomatoses with special consideration of their manifestation in the skin. By Kurt Schröder. 1942.	$11.25
2866-2908	Studies on the autonomous-nervous supply of the bone marrow. By Werner Ernst. 1942.	$7.50
2909-2940	Studies on the hydrogen ion concentration of the skin. By Hanns Löffler. 1942.	$6.25

A COLLECTION OF DOCTORS' THESES. Freiburg, Germany, University. 1941-1943. 883f Microfilm $9.00, Enlargement Print $112.50. PB 84189

The theses reproduced on this FIAT microfilm reel and listed below will be available as enlargement prints. Please include PB and frame numbers when ordering individual items from this reel.

Frames	Title	Price
4713-4774	The sulfonamide treatment of gonorrhea at the Dept. of Dermatology, Freiburg, University. (from its commencement until Sept. 1941. By J. H. Henninghausen. 1942.	$10.00
4775-4800	X-ray observations on the frequency of sclerosis of the aorta in applicants for annuities. By H. G. Hesse. 1942-1943.	$5.00
4801-4869	Permanent success of prolapse operations with the levator plastic as carried out at the Dept. of Gynecology, Freiburg University. By W. Kusch. 1941.	$10.00
4870-4924	Treatment of broken vertebrabodies at the Dept. of Surgery, Freiburg University. By E. W. Reimling. 1942.	$8.75
4925-4947	Growth tests with synthetic fat with addition of ordinary cooking fats and lecithin. By G. Conrad. 1941.	$5.00
4948-4965	Experimental contributions to the problem of the variability of coli and paracoli bacteria. By S. Ehmann. 1942.	$3.75
4966-5000	Purpura rheumatica with ulcerations. By S. Leib. 1942.	$7.50
5001-5015	Results of the first year of active protective inoculation against diphtheria at Freiburg during 1942. By E. Eschenbach. 1943.	$3.75
5016-5029	Duration of pregnancy and birth in cases of nephropathia and eclampsia. By H. Hamm. 1943.	$3.75
5030-5052	Poliomyelitis in Oberbaden (Upper Baden). 1936-1931. By P. Lieb. 1943.	$3.75
5053-5097	Studies on the peculiar form of an electrocardiograph overbalancing to the left and its diagnostic importance. By H. Müller. 1942.	$7.50
5098-5136	Lymphogranulomatosis (Hodgkin's disease) and tuberculosis. By J. Speidel. 1942.	$6.25
5137-5188	The Veritol test. By B. Stubenrauch. 1942.	$8.75
5230-5308	Light and dark adaptation in cases of hypoxemia. By R. Maurer. 1942.	$11.25
5309-5360	Sacro-coccygeal chordomata with special consideration of irradiation diagnosis and irradiation therapy. By F. Skowvouski. 1942.	$8.75
5361-5423	A case of congential gastro-duodenal fistula. By K. Starcke. 1943.	$10.00
5424-5452	Symptomatology of deflection presentation. By H. Strasser. 1942.	$5.00
5453-5484	Experimental studies on the formation of new vessels between omentum and kidney, as well as their functional importance when tying up the arteria renalis. By E. Waldschütz. 1942.	$6.25
5485-5564	Influence of the external administration of drugs upon the reaction of the skin after irradiation. By H. Völker. 1942.	$11.25
5565-5596	Antigens of helminths. By H. Franck. 1942.	$6.25

Textiles and Textile Products

REPORTS ON SYNTHETIC FIBERS. Vereinigte Glanz Stoffabriken A. G., Obernburg, Germany. 1937-1944. 761f Microfilm $9.00, Enlargement Print $97.50. PB 74254

The beginning of this reel (frames 6959-7115) is made up by individual research reports on viscose production, similar to the reports in the preceding reel, D 296 - PB 74180. Titles of these reports are listed below; they are available as enlargement prints. When ordering an individual report please give PB and frame numbers - The remainder of this reel - frames 7116-7719 - contains monthly statements, June 1937 - October 1939, listing the experiments and tests conducted during each of these months at the various plants of the firm. All reports are in German. FIAT Microfilm Reel D-297, Frames 6959-7719.

Frames	Title	Price
6959-7042	Spinning tests with "Rt-" (probably "Ragnit" -) viscose. By Elssner. 1938.	$12.50
7043-7057	High grade cellulose from beach wood for "Rt" rayon. By Elssner. 1938.	$3.75
7058-7061	Packaging. By Naundorf. 1944.	$2.50
7062-7075	No title. (Lecture on spooling rayon). By Heizer. 1944.	$3.75
7076-7094	Contributions to the problem of rayon for tires, particularly fighter plane tires. By Pieper. 1944.	$3.75
7095-7102	The properties of rayon cords, particularly shrinkage. By Pieper. 1944. In part not very legible.	$2.50
7103-7115	"Spulkranz" preparation and processing. By Pieper. 1944.	$3.75
7116-7719	Listing of experiments and tests. 1937-1939. See introduction.	$77.50

REPORTS ON SYNTHETIC FIBERS. Vereinigte Glanzstoffabriken A. G., Obernburg, Germany. 1939-1946. 813f Microfilm $9.00, Enlargement Print $103.75. PB 74187

This is the concluding reel on viscose and related fields (continued from Reel D 297, PB 74254). It contains chiefly monthly progress reports, also a number of individual research reports and two patent applications. Individual items may be obtained as enlargement prints. Please give PB and frame numbers when ordering an individual item. All of these reports are in German. They are as follows:

Frames	Title	Price
7720-8323	Monthly reports, Nov 1939-Nov 1944, listing experiments and tests conducted at the various plants of the firm.	$77.50
8324-8326	Economical use of chlorine in the cellulose industry. By Ranchberg. 1946.	$2.50
8327-8339	Viscose from factory - wet beech wood sulfite cellulose. By Bartunek. 1946.	$3.75
8340-8342	Work program of the institute Seehof. By Funcke. 1945.	$2.50
8343-8348	Duplications of the preceding item.	
8349-8356	The use of sodium salicylate as preliminary swelling agent for cellulose. By Prolft. 1945.	$2.50
8357-8369	Research on the "structure gradient" of cellulose hydrate fibers. By Kratky. 1945.	$3.75
8370-8386; 8388-8388a	Investigations concerning the rising velocities of air bubbles and the process of dissolution of air in viscose. By Jancke. 1945.	$3.75
8387	Attempt at a mathematical treatment of the curves of "structure gradients." n.d. (1945-1946?)	$2.50
8388	See preceding item.	
8389-8400	A new method for a simultaneous swelling and water proofing of cellulose hydrate, by means of a partial esterification with chlorides of aromatic acids. By Prolft. 1945.	$3.75
8401-8403	Influencing the treatment with sulfide by forcing the material through the outlets with varied prenures after mercerization. By Sonnenscheim. 1945.	$2.50
8404-8451	Progress reports, Institute Seehof. 1944-1945.	$7.50
8452-8459	Investigation of the "Rt" process of St. Pölten. By Elssner. 1945.	$2.50
8460-8463	"Perlon" fibers. By Jasicek. 1945.	$2.50

Frames	Title	Price
8464-8491	Research on the swelling of hard fabrics. By Grebert and Werning. 1945.	$5.00
8492-8528	Progress report. By Hilpert. 1945.	$6.25
8529-8530	Process for rendering resistant to swelling synthetic products made of hydrated cellulose such as fibers, threads, etc. n.d. Patent application by Vereinigte Glanzstoff-Fabriken A. G.	$2.50
8531-8532	Process for reducing the swelling properties of precipitated celluloses. 1944. Patent application V 41495 IVd/8k of Vereinigte Glanzstoff-Frabriken A. G.	$2.50

Miscellaneous

A COLLECTION OF DOCTORS' THESES. Frankfurt am Main, Germany. University. 1939-1942. 1033f Microfilm $9.00, Enlargement Print $131.25.

PB 74338

The theses reproduced on this FIAT microfilm reel and listed below will be available as enlargement prints. Please include PB and frame numbers when ordering individual items from this reel.

Frames	Title	Price
1-13	Transverse motions in the weather of May 11-13, 1936 and the theory of the effect of circulation. By O. Geil. 1939.	$3.75
14-39	Determination of the micro-content of homeopathic mother tinctures. By W. Schmidt. 1939.	$3.75
40-48	A statistical study of the fluctuations of atmospheric circulation. By K. Burkhart, 1940.	$2.50
49-66	The influence of an electric field on the emission of the Li, Na, and K atoms. By F. Weller. 1939.	$3.75
67-84	Phosphates of cadmium and manganese. By F. Zureda. 1939.	$3.75
85-95	Generalization of dodecahedron spaces. By H. Friedge. 1939.	$3.75
96-131	Contribution to the knowledge and determination of the antioxygens of oatmeal. By K. Reuland. 1939.	$6.25
132-144	Studies on cooling with special regard to the "Frigorigraph" according to Büttner and Pfleiderer. By A. Kastermann. 1939.	$3.75
145-152	Measurements in a resonance installation for the generation of maximal alternating currents. By G. Hauser. n.d.	$2.50
153-163	The durability of free electrons in after-glowing mercury vapor. By R. Grübling. 1940.	$3.75
164-265	Causing X-ray mutations in Arabidopsis Thelliana (L.) Heynh. and their importance for breeding plants and for the theory of evolution. By E. Reinholz. 1935.	$15.00
266-280	The photochemical formation of sulfuryl chloride from sulfur dioxide and chlorine in light of wave lengths 436 Mk, 405 MK, and 365 MK. n.d.	$3.75
281-296	Functions of concentration in the disintegration of foam of solutions capable of being defoamed partially. Part I and II. By H. J. Breitner. n.d.	$3.75
297-408	Properties of frozen dispersed and dispersedly frozen aqueous systems. By H J. Breitner. n.d.	$16.25
409-440	Absorption of soft x-rays in the human skin and distribution of the intensity of the rays in the upper-most skin-layers in therapeutical surface irradiation. By B. Wilken. n.d.	$6.25
441-475	Allowance for the atmospheric extinction in measurements of the brightness of stars. By J. W. Goethe. 1942.	$6.25
476-477	Advertisements.	
478-541	"Parametric" method for the solution of problems of boundary values. Part 1 and 2. By L. Sauer. 1942.	$10.00
542-553	The dehydration of calcium hydroxide (and the hydrates of calcium sulfate) at high pressures. By C. G. Berge. 1941.	$3.75

Frames	Title	Price
554-564	Contribution to the knowledge of copper turning green. By H. Kaster. 1941.	$3.75
565-574	Contribution to the knowledge of the change of arsenic linkage in alcoholic fermentation. By O. Schülke. 1941.	$2.50
575-584	The influence of mountains on the profile of atmospheric pressure. By K. Bullrich. 1941.	$2.50
585-626	Emanation measurement in flowing gases by the counting tube method. By K. Sittel. 1940.	$7.50
627-673	Starting the oscillations of the filter generator. By K. Kost. n.d.	$7.50
674-730	The effect of sodium chloride solutions on tricalcium aluminate. By D. Dschorbenadse. n.d.	$8.75
731-747	Polynucleated condensed systems with heterocyclic rings. By M. Wagner - Roemmich. 1940.	$3.75
748-764	Determination of lactic acid in animal and vegetable substances. By K. Mollen-Kopf. 1940.	$3.75
765-773	Measuring conductivity and dielectric constant of biological bodies in the wave length range of 400 - 10 000 m. By R. Stachowiack. 1940.	$2.50
774-781	Minute recordings of barometric pressure. By C. A. Pfeiffer. 1939.	$2.50
782-793	Device for generating and studying hard γ-rays. By H. Leug. 1940.	$3.75
794-809	Measuring the number of condensation nuclei of various nuclear sources in a certain space, and their remaining in the upper respiratory tract. By W. G. Bunde. 1940.	$3.75
810-827	Trajectories of air and their divergence. By K. Lotz. 1940.	$5.00
828-856	Research into the series of hydroxy and alkylhydroxy oxindoles. By M. R. Tulus. 1940.	$5.00
857-869	The influence of erythrosin and eosin on the reactivity of Avena and Cucumis germs towards growth substances. By G. Stahlberg.	$5.00
870-886	Absorption measurements in electrically excited krypton by means of the variable light method. By H. Ommert. n.d.	$3.75
887-898	Intermediaries falling on as solids in the formation of nickel aluminate from nickel oxide and aluminum oxide. By K. Grob. 1940.	$3.75
899-911	The reactions between monovinylacetylene and chlorine and monovinylacetylene and bromine. By K. Rengert. 1939.	$3.75
912-926	The photochemical reaction between bromine and chloral. By H. Klug. 1940.	$3.75
927-943	The equilibria Fe+Co O = FeO+CO and Fe+Ni O = Fe O+Ni in the melt with consideration of the oxygen content in the metal phase. By P. Pickhart. 1939.	$3.75
944-955	Study on the isomorphic substance of elements in phosphates of earth alkali metals. By F. Steckenreiter. 1940.	$3.75
956-970	Studies on condensation nuclei and light ions in air-cooled rooms. By G. Schlarb. 1940.	$3.75
971-984	Chemico-physiological studies on the vasodilative effect of extractives of organs. By V. Klingmüller. 1939.	$3.75
985-1020	Intermediaries falling on as solids in the formation of willemite from zinc oxide and silicic acid. By H. Riel. 1941.	$6.25
1021-1033	Polynucleated condensed systems with heterocyclic rings which contain oxygen. By H. J. Rossins. 1941.	$3.75